

**Either You Control Social Media or Social Media Controls You: A
Multi-paradigmatic Approach to Understanding Excessive Social
Media Use**

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in the University of Canterbury

by
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Abstract

Social media has created new ways to engage in social interaction. Notwithstanding its positive impact, researchers have warned that excessive social media use undermines personal well-being. Apart from this, recent studies have revealed an inconsistency between attitudes towards social media and actual behaviour: users may have negative feelings about social media use but still log in every day. This paradox is attributed to impulsivity, which is difficult to control and reflect on. However, current papers rely mostly on self-report measures and investigate conscious attitudes rather than non-conscious impulsive behaviours.

To address possible inconsistencies, this study adopts a Transformative Consumer Research (TCR) lens (Mick, Pettigrew, Pechmann, and Ozanne 2011) which encourages a diverse paradigmatic approach and enhances practical consumer wisdom (Mick et al. 2011; Mick and Schwartz 2012). In this way, users of technology are placed at the centre of the research to investigate their behaviour and promote positive consumer well-being.

This thesis includes two sequential studies. Study One presents the first known attempt to review the current literature on the conceptualisation of self-control on social media. As a result, the chronological order of the applied frameworks demonstrates a gradual switch from theories of planned behaviour to theories interpreting non-planned behaviour and self-control failures. This explains the focus of recent studies on impulsivity and dual-system theories in the context of social media use. Following the findings of the literature review, Study Two provides evidence that excessive social media users demonstrate an imbalance between the impulsive and reflective systems in their minds. Drawing on dual-system and self-control theories, this research empirically investigates relationships between implicit attitudes towards social media and its excessive use. For

this, implicit and explicit measurements are combined in one study. The findings show that excessive social media users are guided by their implicit attitudes rather than explicit beliefs and intentions. Although a high level of self-control is a significant indicator of healthy social media use, it is not helpful for excessive users with a positive implicit attitude and high impulsive use. Such a duality of self-control dispels beliefs about its ultimate power and raises questions about business ethics. To sum up, this thesis (1) reviews current self-control frameworks with regard to the social media context and provides deeper theoretical knowledge for future self-control interventions; (2) fills a theoretical gap by conceptualising what constitutes excessive social media use; and (3) offers practical suggestions for non-academic stakeholders on how to reduce excessive use and promote positive well-being.

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Chapter 1. Introduction: How much is too much?

“Social networking is a way of being. First, being ‘on’ has become the status quo. Second, there appears to be an inherent understanding or requirement in today’s technology-loving culture that one needs to engage in online social networking in order not to miss out, to stay up to date, and to connect”

– Kuss and Griffiths (2017, p. 5)

1.1 Introduction

Social media use has altered the daily routines of almost half the world's population (Wearesocial.com 2019). The average user spends 2 hours and 23 minutes on social media daily (GlobalWebIndex 2019) – more than the average time for eating, reading and physical activity in a given 24-hour day (Statistic 2018).

With respect to the local context, New Zealand has 71% of active social media users out of the total population of 4.89 million, which places the country in 11th place according to the level of social media use in the world (Wearesocial.com 2019). A survey on more than 540 000 adolescents in 73 countries (Collins 2017) reports that one in six New Zealand 15-year-old teens is online for more than six hours a day, mostly on social media, with their schoolwork and sleeping time affected by this choice. "I'm always on. I can't live without being on my phone and social media" is an example of a West Auckland schoolgirl's experience.

Research shows that excessive social media use undermines users' well-being and results in countless negative outcomes, such as declined academic performance; poor time-management; difficulties with attention and focus; decreased sociability; ruined relationships in the family and professional life; feelings of loneliness, anxiety, and depression; low self-esteem; lack of sleep; and other health problems (Bányai et al. 2017; Blinka et al. 2015; Frost and Rickwood 2017; Hardie and Tee 2007; Kirschner and Karpinski 2010; Turel, He, Xue, Xiao, and Bechara 2014). Academics (Frost and Rickwood 2017; Guedes et al. 2016) emphasise that these consequences are the tip of the iceberg and stress the urgent need to investigate the antecedents of excessive social media use.

More and more studies reveal inconsistencies between negative outcomes of excessive social media use and ongoing recurrence of this behaviour. Despite the human ability for planned behaviour, users exhibit considerable unhealthy, impulsive behaviours, such as logging on daily in spite of a resultant worsening mood (Sagioglou and Greitemeyer 2014); switching to social media during lectures in spite of the impact on academic performance (Cao, Masood, Luqman, and Ali 2018); using social media while driving and therefore risking lives (Turel and Qahri-Saremi 2016); or waking up during the night to check a social media profile and feeling exhausted the next day (Power, Taylor, and Horton 2017). It raises questions about individuals' ability to control their own behaviour and excessive social media use with its disturbing consequences. Therefore, the main focus of this work is the imbalance between conscious reflective and non-conscious impulsive behaviour of excessive social media users.

To delve deeper, this thesis includes the outputs of two sequential studies, Study One and Study Two. The conclusions of Study One became the theoretical grounding for the research design of Study Two. For this, Study One introduces the first known attempt to review the current literature on the conceptualisation of self-control on social media. For this, 25 papers from seven academic databases were analysed in chronological order in a systematic literature review. The sequence of applied frameworks demonstrates a gradual change of focus from theories of planned behaviour to theories which explain non-planned behaviour and justify self-control failures. This finding explains the emphasis of recent studies on the impulsive behaviour of excessive social media users.

Then, this research draws on the results of the literature review in Study One to design Study Two. In the second study, this work follows the framework of Transformative Consumer Research (TCR) and, hence, users are placed at the centre of the research. By

applying dual-system theories, this study combines conscious explicit with non-conscious implicit measurements. Therefore, the current work goes beyond the use of self-report scales to incorporate the implicit association test (IAT) as a means of understanding underlying attachment to social media. With this approach, the underlying mechanism of excessive social media use is conceptualised from the perspective of the ambivalence of attitudes.

To this end, this study aims to explore the imbalance between conscious reflective and non-conscious impulsive behaviour of excessive social media users. This investigation shows that excessive social media users are guided by their implicit attitudes rather than conscious beliefs and that self-control techniques may be efficient in specific conditions only. Then, a TCR lens is adopted to understand the contradiction between impulsive social media use and harm to self to resolve this tension. Using findings of this study, this thesis provides practical suggestions for non-academic stakeholders such as social media users, social media firms and public policy makers.

To summarise, Chapter One provides an overview of the manuscript. First, the research background is discussed by focusing on how much is too much with regard to social media use. To define this criterion, Chapter One lists positive and negative consequences of social media activity. Then, it is examined how the problematic social media use is measured by investigating absolute and relative measurements of excessive social media use. The review of measurements reveals certain inconsistencies and, therefore, existing gaps in this research domain. To move forward, this Chapter describes the main aim for the current thesis, research objectives and the methodological approach being used. Chapter One is finalized by presenting the thesis outline and explaining the sequence of chapters.

1.2 Research Background: Defining Excessive Social Media Use

The rapid rise of social media goes in parallel with an increasing number of its definitions. The concept of social media is thoroughly described by Kaplan and Haenlein (2010). Researchers define social media as Internet applications for creating and sharing user-generated content. At the same time, they differentiate social networking sites such as Facebook or Twitter as Internet applications allowing users to create their online profiles and share various online content including messages, images, video, audio and other files with their online contacts or friends. In 2010, Facebook has reported 608 million registered users compared to 2.603 billion in 2019 (Statista.com 2020a; Wearesocial.com 2019). However, even at earlier times researchers highlight the business potential of social networking sites and suggest business companies “not to miss this train” (Kaplan and Haenlein 2010, p. 68)

The further development of social media results in an ongoing extension of its interpretations. In this way, Kietzmann et al. (2011) extend the functional definition of social media by introducing its seven blocks of identity, conversations, reputation, presence, relationships, sharing and groups. Researchers claim that social media changes common ways of communication and stress on the right balance between all functionality blocks at a personal and organizational level. Later, Coulson (2013) also adds to the definition of social media and describes it as a web-based tool which enforces social interaction between users. In this vein, the researcher highlights the emerging impact of social media on life values and public policies. This approach noticeably broadens the conceptual understanding of social media as a group of Internet-based applications. Going further in their studies on excessive and addictive social media use, Kuss and Griffiths (2011a; 2017) agree with the previous definitions of social media as virtual

communities providing advanced opportunities of social interaction based on shared interests. However, researchers stress on an exponential rise of these social interactions which interfere in daily life irrespective of any time limitations. Though being social, this online interaction may result in reverse feelings of being “alone together” (Kuss and Griffiths 2017, p. 1). This diversity of definitions and interpretations for social media requires identifying conceptual boundaries of this term at the beginning of the study. This research joins many other academics in describing social media as web-based social communities with advanced features of creating and sharing the content. However, this study highlights the role of social media use in the daily routine of excessive users who may experience addictive feelings to it (Griffiths, Kuss, and Demetrovics 2014). Therefore, this research explores social media from the perspective of its impact on users’ behavioural patterns and users’ attitude to it.

1.2.1 Positive and Negative Impacts of Social Media Use

The current literature demonstrates ongoing disputes about the positive and negative impacts of social media use on users’ well-being (Aalbers, McNally, Heeren, de Wit, and Fried 2019; Brooks 2015; Hou, Xiong, Jiang, Song, and Wang 2019; Krasnova, Wenninger, Widjaja, and Buxmann 2013; Kross et al. 2013; Lin et al. 2016; Verduyn, Ybarra, Résibois, Jonides, and Kross 2017). Gonzales (2010) insists that viewing Facebook profiles increases users’ self-esteem and contributes to the positive effects of self-presentation. Exploring other positive aspects, Berger and Buechel (2012) provide evidence that emotionally unstable individuals are more likely to express themselves on social media which recovers and boosts their well-being. To remove doubts about the beneficial impact of social media, other researchers (Burke, Marlow, and Lento 2010; Jelenchick, Eickhoff, and Moreno 2012) report that social media use is not linked to

depression but correlates with social capital increase and greater well-being. Meanwhile, Verduyn et al. (2017) aim to reveal more evidence and answer the same question about whether social media enhances or worsens well-being. Their conclusion is dual. If used actively, i.e. making comments and engaging on social media activities, social media is positively associated with subjective well-being. The opposite conclusion relates to passive use.

However, multiple studies provide evidence on the deteriorating impact of social media use. Davila et al. (2012) insist that social media experience is correlated with symptoms of depression. In support, Woods et al. (2016) show that a stronger emotional connection with Facebook results in higher levels of depression and anxiety. In the same vein, other researchers (Kalpidou, Costin, and Morris 2010; Krasnova et al. 2013) emphasise that spending a lot of time on social media is connected with low self-esteem and regular feelings of envy which makes users experience social media sites as stressful digital platforms. Furthermore, the latest studies demonstrate the harmful impact of social media on concentration, decision making, individual academic and job performance (Andreassen, Torsheim, Brunborg, and Pallesen 2012; Meshi, Elizarova, Bender, and Verdejo-Garcia 2019; Yu, Cao, Liu, and Wang 2018). This influence results in feelings of loneliness and interest loss, fatigue, ruined relationships, permanent lack of sleep, lower self-esteem, depression and other mental issues (Aalbers et al. 2019; Bányai et al. 2017; Lin et al. 2016; Shonin, Van Gordon, and Griffiths 2014; Turel et al. 2014). On the whole, Brooks (2015) concludes that social media use increases the level of “technostress” and negative consequences both for well-being and personal efficiency. In either case, reporting both positive or negative consequences, researchers (Ngai, Tao, and Moon 2015) warn that the impact of the social media use on users’ mental well-being is no longer in doubt. In the meantime, the negative impact outweighs the positive when

social media use becomes excessive (Guedes et al. 2016; Kuss and Griffiths 2011a; Yu et al. 2018; Zendle and Bowden-Jones 2019). Then, the logical questions would be how to define excessiveness in use in order to reduce it.

1.2.2 Measuring Excessive Social Media Use

Considering the possible unhealthy consequences of social media use, this study attempts to determine “how much is too much”. Drawing on the current literature, the existing measures of excessive social media use are explored from two perspectives. On the one hand, some researchers provide absolute measures of unhealthy social media use such as the duration of use and its frequency. Conversely, other investigators insist that relative measures of social media use are highly applicable to explore this type of problematic behaviour. This thesis explores these two perspectives and suggests a focus on inconsistencies which can be relevant both for absolute and relative measures of excessive social media use. This investigation is described in the three following subsections.

1.2.2.1 Absolute Measures of Excessive Social Media Use

There is no one single definition of excessive social media use which could be acknowledged by all academics in the current literature (Hong, Huang, Lin, and Chiu 2014). In the meantime, the definition of excessive involvement is often linked to the amount or the duration of an activity which is greater or higher than is necessary (Johnston, Reilly, and Kremer 2011). Yet, just a few studies define excessive social media use by using precise cut-offs of time or frequency of use. Researchers have variously defined “excessiveness” from four times per day, or from one to over five hours daily (Pelling and White 2009; Ross et al. 2009; Thompson and Loughheed 2012). This absolute approach is limited considering that sometimes users do not want or cannot precisely

estimate the duration and frequency of their use (Olufadi 2016). Consequently, this produces over- or underestimation of the social media use which may result in the findings of studies being questioned. Then, the interpretation of excessive behaviour based on time measurements and without the context is doubtful. Caplan and High (2006) describe an example of web programmers who spend a great amount of time on the Internet daily but benefit from the time spent online rather than harming their well-being. In addition, absolute measurements of social media behaviour may result in confusing conclusions because of cultural differences in social media and Internet use (Tao et al. 2010).

Finally, it is impossible to omit the fact that the daily routine of an average worldwide user includes more than two hours on social media already (GlobalWebIndex 2019; Wearesocial.com 2019). Clearly, the rapid growth of social media use outpaces the conclusions of investigators on the duration of unhealthy use. Together with described limitations, this trend makes it doubtful if researchers may rely only on absolute measurements when defining excessive social media use.

1.2.2.2 Relative Measures of Excessive Social Media Use

To expand the understanding of excessive social media use, Andreassen (2015) explains that it makes users redistribute their daily time and spend it less on work, social and leisure activities, their relatives and friends. Other researchers (Kirschner and Karpinski 2010; Kuss and Griffiths 2011a) illustrate it with examples of individuals losing their jobs or having decreased academic performance because of excessive social media use during a day. Such an imbalance between different daily activities raises more questions about whether it can be measured by duration only. Adding to this, Coyne et al. (2020) provide surprising findings that increased time on social media is not associated with

more mental health problems. Thus, excessive time is a necessary but not sufficient condition for negative outcomes (Caplan and High 2006).

Accordingly, researchers attempt to evaluate excessive social media use with relative measurements or by joining them with the absolute ones. For relative measurements, academics mostly borrow scales from studies on other known addictive behaviours. For instance, the widely used Facebook Addiction Scale examines six reliable factors of addiction such as salience, withdrawal, mood modification, relapse, conflict and tolerance of Facebook users (Andreassen et al. 2012). A modified version of this scale is used to measure excessive Internet use as well (Blinka et al. 2015). In the literature review on social media addiction, Andreassen (2015) describes three other acknowledged scales, specifically the Facebook Dependence Questionnaire, Social Networking Website Addiction Scale (SNSWAS) and Addictive Tendencies Scale (ATS). All these scales are based on reliable items borrowed from addiction scales for various behaviours such as online gaming addiction. Therefore, they include rather relative addiction criteria than absolute measurements of excessiveness.

Another approach to measure excessive use is based on the impact on personal well-being. For this, researchers (Hong et al. 2014; Koc and Gulyagci 2013; Lee, Cheung, and Thadani 2012b) develop Facebook addiction items by adapting acknowledged scales for measuring Internet addictive or problematic use such as Young's Internet Addiction Test, Generalized Problematic Internet Use Scale, Chen Internet Addiction Scale and others (Aboujaoude 2010; Caplan 2010). Beyond addiction criteria, these scales include various domains of use-related problems and consequences for personal well-being, i.e. health issues, interpersonal and time management difficulties. Going further, Olufadi (2016) confirms that time measurement is not sufficient to analyse social media use and calls it

a debate between the quality and quantity of time spent. The researcher introduces a new Social Networking Time Use Scale (SONTUS) and suggests exploring excessive use by considering the context of its use and its impact on the daily life of individuals. This scale includes 29 items relating to situations or places where respondents use social media, e.g. “when you are in a bed about to sleep” which defines the extent to which social media interferes in daily routine.

On the whole, investigators tend to use a mixed approach and join both absolute and relative measurements in their studies. In many cases, they start a survey design with absolute measurements as qualification criteria. Then, they draw on scales with relative measurements but add absolute items on use as control variables. In this manner, researchers switched from defining excessive use based on precise cut-offs to the analysis of the correlation between absolute and relative measurements.

1.2.2.3 Inconsistencies in Measurements

As noted above, researchers (Morrison and Gore 2010; Young 1998) stress that the use of technologies becomes excessive when it interferes with daily life and results in problems with personal well-being. When people neglect life values in favour of technologies, their contradictory behaviour becomes problematic (Sagioglou and Greitemeyer 2014; Turel and Qahri-Saremi 2016). In the meantime, this type of behaviour suggests that users harm their life priorities by themselves. This observation unveils a gap between conscious attitudes and daily actions. Researchers (Delaney, Stein, and Gruber 2018; Du, Kerkhof, and van Koningsbruggen 2019) attribute it to impulsive use. However, most studies on social media rely on self-reports (Frost and Rickwood 2017) that explore conscious intentions rather than impulsive behavioural responses. Academics (Caswell, Celio, Morgan, and Duka 2015) warn that such an approach is

restricted by reliance on self-understanding which is biased by many factors and not always trustworthy.

Nevertheless, there is limited research on the antecedents of this inconsistent excessive behaviour. The current work aims to cast some light on the similar discrepancy between attitudes and behaviour in the context of social media use by considering possible biases in measurements. For a deeper understanding, conscious explicit measurements are combined with non-conscious implicit measurements to interpret excessive social media use from the perspective of balancing between reflective and impulsive systems in the minds of users.

To address described gaps, this manuscript introduces the main Research Aim and three Research Objectives for this study. They represent the main focus and outline a pathway for this manuscript. This chapter outlines the aims and objectives while findings are discussed in Chapter Seven.

1.3 Research Aims and Objectives

Considering the discussion above, the current investigation is exploratory rather than confirmatory in its nature. By acknowledging this, this work seeks to explore what drives excessive social media use, why conscious attitudes and intentions of excessive social media users may contradict with their actual behaviour, and if they are able to control the problematic outcome. In this vein, the overall aim of the research is to:

Investigate the impact of self-control on the underlying mechanism of excessive social media use and personal well-being.

To address this aim, this study focuses on the following main objectives:

- 1. To understand how self-control is conceptualised for the social media context in the current literature.*
- 2. To fill a theoretical gap on what constitutes excessive social media use and the impact of self-control on it.*
- 3. To offer practical suggestions for excessive users, social media marketers and public policy makers to reduce the extent of excessive use and promote positive well-being.*

All three objectives of the current study are listed in sequential order. In this way, the deeper knowledge of self-control frameworks from Objective One provides the theoretical grounding to address Objective Two. Then, findings from investigations for Objective One and Two make it possible to focus on Objective Three and suggest practical recommendations.

1.3.1 Objective One: to understand how self-control is conceptualised for the social media context in the current literature

In spite of all the known benefits of social media, recent studies claim that its excessive and addictive use results in problematic outcomes for physical and mental health (Bányai et al. 2017; Frost and Rickwood 2017; Guedes et al. 2016). A number of studies (Kuss and Griffiths 2017; Seymour 2019; Tiku 2018) highlight commonalities between excessive social media use and other known harmful addictions. With growing concerns about problems for personal well-being, self-control is expected to become an effective approach for excessive users in managing their daily social media use (Cudo, Torój, Demczuk, and Francuz 2019; Franks, Chenhall, and Keogh 2018). At the same time, the

current literature has a lack of conceptual studies on this research domain for this particular context.

At the theoretical level, researchers (Sussman and Moran 2013; Tan, Kuek, Goh, Lee, and Kwok 2016) connect various excessive technology-related behaviours with substance and activity-based addictions. These findings allow an assumption that the acknowledged frameworks of addictive and excessive behaviours may be relevant for the Internet and social media as well. Following this, a number of the latest studies (Franks et al. 2018; Loid, Täht, and Rozgonjuk 2020; Stieger and Lewetz 2018) plan self-control interventions for problematic technology-related and social media use based on traditional theories adapted for new technologies. Researchers report the failures of their self-control interventions which did not change the users' unhealthy behaviour. Two studies (Franks et al. 2018; Stieger and Lewetz 2018) suggest that excessive social media use is cyclical and, therefore, results of any self-control interventions are revocable. Then, the mechanical application of acknowledged traditional theoretical frameworks for studies on social media becomes questionable.

In this regard, Kuss and Griffiths (2017) stress the eclectic aspect of addictive social media use. They describe multiple features of this phenomenon and highlight an urgent need for researchers and practitioners to cooperate and enable a reliable assessment of unhealthy social media behaviours. Going further, Turel et al. (2014) suggest morphological differences between patterns of traditional problematic behaviours and excessive social media use. The academics make assumptions about why self-control techniques, which are efficient for traditional problematic behaviours, may be irrelevant for social media use. These claims require a deeper investigation about what is known about self-control theories on social media at this stage.

Accordingly, Objective One aims to explore the conceptualisation of self-control in the social media context in the current literature. Namely, this study investigates what self-control theories are presently applied in studies on excessive social media use for users to be able to decrease their problematic behaviour. In response, this research synthesises this knowledge and suggests my findings in the systematic literature review of Study One (Chapter Three). Afterwards, the theoretical findings of Study One provide a robust theoretical grounding to introduce the research model to pursue Objective Two.

1.3.2 Objective Two: to fill a theoretical gap on what constitutes excessive social media use and the impact of self-control on it.

As has been discussed previously, social media use becomes excessive for users when it conflicts with their long-term goals and life values (Turel and Qahri-Saremi 2016). Multiple papers on social media addiction (Andreassen 2015; Bányai et al. 2017; Kuss and Griffiths 2011b) confirm that uncontrolled social media use may potentially result in harmful outcomes for well-being including health-related, emotional and relational problems. Hou et al. (2019) support a similar interpretation of problematic behaviour in the social media context. Also, they explain that time and frequency are not obligatory predictors of problematic social media use unless it becomes uncontrollable. To address this, researchers focus on self-help techniques first of all.

Meanwhile, managing social media use does not appear to be just a matter of intention and willpower for excessive users. Academics (Cao et al. 2018; Power et al. 2017; Sagioglou and Greitemeyer 2014; Turel and Qahri-Saremi 2016) provide evidence of inconsistencies between self-reported attitudes towards social media and actual problematic behaviour. Then, a personal ability to manage problematic behaviour becomes doubtful. To explore self-regulation skills on social media, Franks et al. (2018)

conduct self-control interventions for young Facebook users who suffer from technostress. Researchers report disturbing findings. They introduce the cyclical pattern of social media sabbaticals, i.e. long-term interruption of social media use. On the one hand, the discontinuation of using social media is claimed to be beneficial. At the same time, users tend to reconnect and start the cycle of use from the beginning, on the other. Researchers call it a “Facebook sabbatical paradox” (Franks et al. 2018, p. 11) and describe how young adults struggle to balance between an intention to decrease technostress and negative emotions while being away from social media accounts. Eventually, it is difficult for users to manage problematic use in spite of their conscious desire. This discussion is enflamed by claims of former social media leaders (Solon 2017; Wang 2017). They confess that social media platforms are using the vulnerabilities of human behaviour and the impact of the harm is not fully clear yet.

Following the main pathway of the current thesis, this study demonstrates a lack of agreement on the conceptualisation of self-control on social media in Study One. Based on this, Objective Two aims to explore what constitutes excessive social media use and to define possible ways for self-control to interfere.

1.3.3 Objective Three: to offer practical suggestions for excessive users, social media marketers and public policy makers to reduce the extent of excessive use and promote positive well-being.

The current exploration has a practical focus, first of all. Chapter Two and the literature review for this thesis start by introducing the framework of Transformative Consumer Research (TCR) (Mick et al. 2011). TCR places the consumer at the centre of the research and enhances practical consumer wisdom (Mick et al. 2011; Mick and Schwartz 2012). For this, the TCR framework encourages a diverse paradigmatic approach and effective

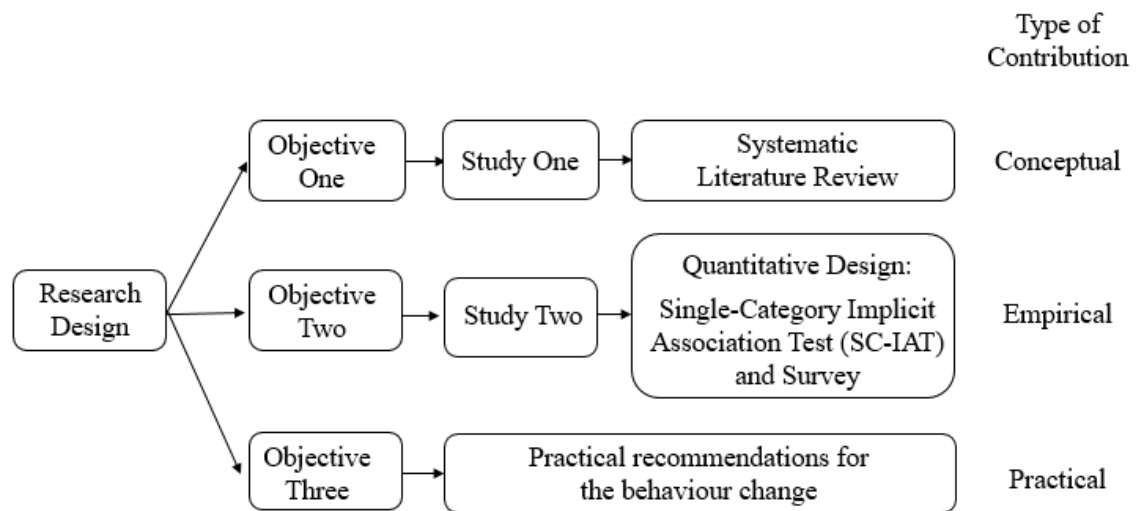
dissemination of research findings. Following the pragmatic TCR orientation, this work focuses on excessive users, first of all. In this regard, this work is challenged by the TCR guideline to draw on a meticulous theoretical approach to provide helpful practical recommendations for various parties involved. Therefore, the current research transforms the theoretical implications of this investigation into practical suggestions for non-academic stakeholders. i.e. excessive social media users themselves, social media marketers and businesses, and public policy makers.

In summary, the investigations on Objective One and Objective Two result in the theoretical and empirical findings which become a theoretical foundation for practical recommendations to address Objective Three.

1.4 Research Methodology

To address the main aim and objectives, this investigation includes two sequential studies and several research techniques. Figure 1.4.1 demonstrates the overall approach to the design of the current study.

Figure 1.4.1 Research Design



As far as known, there are no literature reviews on self-control theories on excessive or problematic social media use. To address this lack of knowledge, this study provides a systematic literature review within Study One. This methodology is dictated by the main aim and Objective One. This work inevitably needs the synthesis of the existing knowledge on self-control frameworks to explore the mechanism of excessive social media use and the impact of self-control on it. In this way, Study One provides both the conceptual contribution and theoretical grounding for Study Two.

In quantitative Study Two, this research introduces a conceptual framework for the current thesis and eight hypotheses to investigate the relationships between constructs. The hypotheses are tested in an empirical way to provide a theoretical contribution to the current body of knowledge on excessive social media use. For this, an online cross-sectional study is conducted. This research design is selected for several reasons. Cross-sectional studies should be considered when little is known about the phenomenon, when patterns of relationships are not yet established, and when the timeframe for the causal relationships is not known (Spector 2019). In other words, the cross-sectional design is highly relevant when the research is rather exploratory. In addition, it is premature to

invest substantial resources in longitudinal or experimental studies before relationships between variables are established. Hence, this research supports Spector's (2019) claim that the value of research is not in its design, but in the design's relevance to the research questions. A cross-sectional study is conducted in Study Two to provide deeper knowledge for further longitudinal studies and interventions.

With regard to the research design of Study Two, the exploration of both the impulsive and reflective systems in the minds of excessive users is conducted. In this way, this study investigates the reasoning of a contradiction between users' conscious attitudes and their real-life behaviour. Frost and Rickwood (2017) highlight that current studies on social media rely mainly on self-report measurements which is not always trustworthy. On the one hand, self-reported responses may be biased because respondents may intentionally report socially desirable behaviour. On the other, self-report measures are limited by the reliance on self-awareness and self-reflection which is often contradictory to impulsive behaviour (Caswell et al. 2015). To address this, this research joins self-report explicit measures with implicit measurement techniques. To measure implicit attitude towards social media, the current study employs the reliable Implicit Association Test (IAT), specifically its deviation which is the Single Category Implicit Association Test (SC-IAT) (Greenwald, McGhee, and Schwartz 1998; Greenwald, Nosek, and Banaji 2003; Karpinski and Steinman 2006). Then, participants are asked to answer questions from the self-report questionnaire which is described in Chapter Five of the thesis. In this way, this study analyses the relationship between implicit and explicit attitudes towards social media with its excessive use and self-control.

Finally, the conceptual contribution of Study One is joined with the empirical findings of Study Two to suggest practical recommendations and approach Objective Three. The

final stage of this research aims to provide non-academic stakeholders, specifically excessive users, social media business companies and public policy makers, with applicable practices on how to decrease unhealthy social media use and boost personal well-being. Therefore, the connection between all three objectives of this research is sequential. The theoretical outcome of Objective One and empirical conclusions of Study Two address the challenging practical focus of Objective Three.

To summarise, the methodology of the current exploration covers more than one research discipline which corresponds to the multi-paradigmatic TCR framework (Mick et al. 2011). The primary aim of this investigation is based on an intention to explore how users consume social media from the classical perspective of consumer behaviour. However, this work follows a call from researchers (Veer 2011) to consider changes in consumer research design caused by the rapid distribution of new technologies. For this, the current study draws on the family of theories of behaviour change (Gainforth, West, and Michie 2015) and, therefore, takes the TCR approach (Mick et al. 2011) to encourage healthy social media use. Beyond that, implicit measurement tools are borrowed from the research area of the psychology of behaviour (Gao, Jia, Zhao, and Zhang 2019; Greenwald et al. 1998; Karpinski and Steinman 2006; Leng et al. 2019). Finally, this work leads to conclusions related to business ethics which is crucially important for all stakeholders involved. This multi-dimensional approach is deliberate. In this way, this research explores the disputable phenomenon of excessive social media use from various perspectives. The use of the multi-paradigmatic research design may reveal the underlying mechanism of excessive social media behaviour.

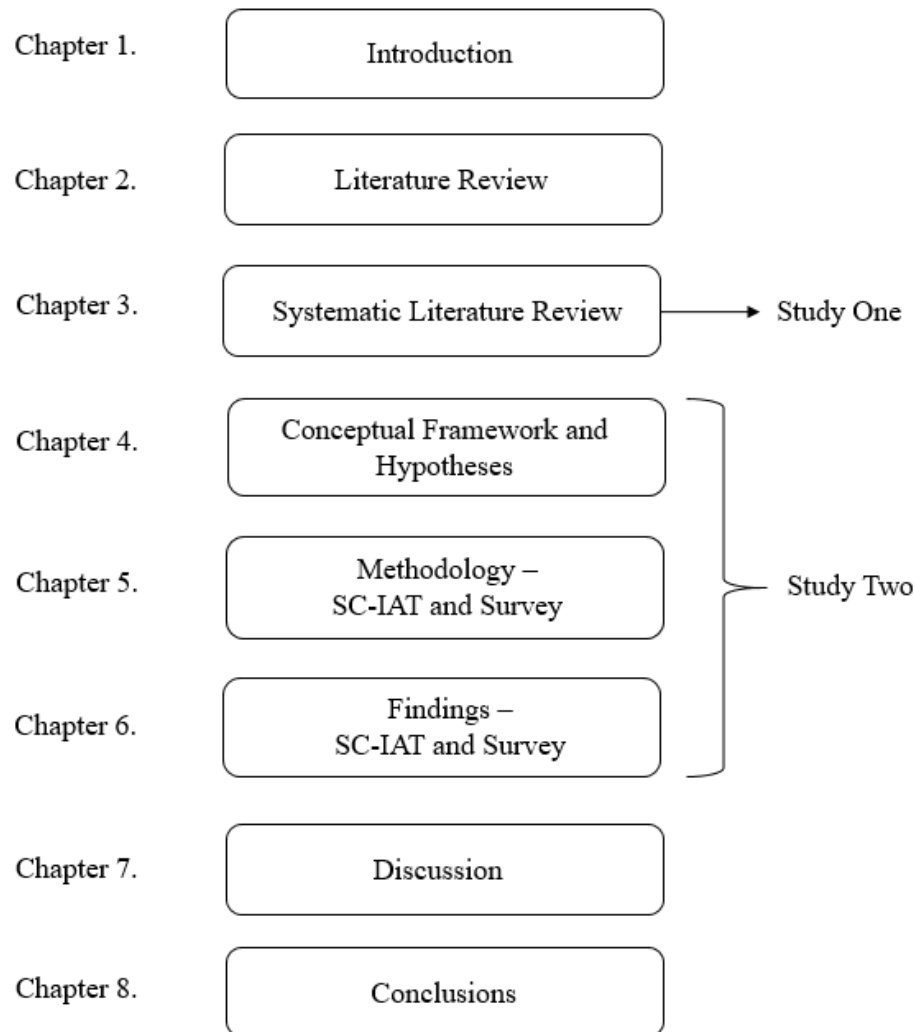
1.5 Thesis Outline

This thesis includes eight chapters as presented in Figure 1.5.1.

The current Chapter One introduces this study and justifies the chosen exploration scope and highlights the importance of this exploration. From here on, this study follows the defined research aim and three research objectives to explore the mechanism of excessive social media use and the impact of self-control on it.

This investigation starts with Chapter Two presenting the literature review to reveal research gaps in the literature. This chapter is divided into four primary sections. The first section discusses the TCR approach which outlines the main conceptual framework for this study. The second section explores the nature of excessive behaviours which broadens the context of this thesis. For this, this investigation starts with a review of known excessive non-media behaviours such as drinking, smoking, overeating and others, and excessive screen media use which includes social media use as well. This section concludes on the ambivalence of excessive behaviours. Consequently, it is followed by the third section on the current knowledge of dual-system theories. The final fourth section of Chapter Two introduces what is discussed about the impact of self-control on social media use in the current literature. In this way, Chapter Two introduces four research questions for this study. In parallel, it demonstrates that the extended literature review is needed to synthesise existing conceptual frameworks on self-control on social media for this thesis.

Figure 1.5.1 Thesis Outline by Chapters



Consequently, Chapter Three provides a systematic literature review on the conceptualisation of self-control for problematic social media use. In this way, Chapter Three introduces the results of Study One. Based on these findings, Chapter Four introduces the conceptual framework and eight hypotheses for Study Two. Then, Chapter Five provides details on the methodology of the second study while Chapter Six reports the main quantitative findings. As such, Study Two is mainly covered by Chapters Four, Five and Six. Chapter Seven consolidates all the findings from Study One and Study Two which results in both research and managerial implications. Research limitations and

Chapter One. Introduction: How much is too much?

avenues for future explorations complete Chapter Seven. Finally, Chapter Eight outlines this manuscript's conclusions.

Chapter 2. Literature Review

“...we shall never receive the right answers to our questions unless we ask the right questions”

– Wiener (1954, p. 186)

2.1 Introduction

The aim of this chapter is to provide a review of the current literature and the theoretical grounding for both Study One and Study Two.

For this, the current chapter is divided into four key sections. This chapter starts with the description of the TCR transformative approach and its challenging tasks. After setting out the TCR framework, this study explores the nature of excessive behaviours in the second section. In this way, the current investigation is not limited to excessive social media use only. It starts from learning about the most wide-spread excessive behaviours such as excessive drinking, smoking, shopping and others. Later, this exploration switches to excessive behaviours in the digital environment. Then, this work introduces findings on the commonalities between well-known excessive behaviours and recently emerged excessive screen media behaviours. This approach allows to set a more inclusive framework for the study and interpret excessive behaviour beyond the social media use context. This review results in the conclusion on the ambivalence of attitudes for all excessive behaviours. Therefore, the third section of the current chapter explores possible reasoning for contradictory attitudes in the same individual by drawing on dual-system theories. Finally, a deeper understanding of various types of excessive behaviours and the dual-system framework leads us to investigate what is known and not known about the impact of self-control on excessive social media use. In this manner, this study sequentially presents four research questions for this study.

Overall, Chapter Two concludes with an outline of research gaps which are consequently addressed by Study One and Study Two. Additionally, this chapter includes a summary of the research aim and objectives with theoretical and practical implications as the main guideline for this study.

2.2 Transformative Consumer Research (TCR) and Business Ethics

In contrast to the traditional business approach, TCR places consumers at the centre of the research and investigates consumer behaviour for the good of consumers (Mick et al. 2011). Founded within the Association for Consumer Research, TCR emphasises the importance of studies on the business ethics and links this conceptual approach to the enhancement of practical consumer wisdom (Mick 2006; Mick et al. 2011; Mick and Schwartz 2012). Academics follow Aristotle's notion of practical wisdom and apply it to today's consumers. Mick and Schwartz (2012) explain that practical consumer wisdom is a complicated combination of multiple factors which are not limited to expertise, rational reasons and thoughtful decision making. Being a wise consumer also implies context-based decisions which are primarily aimed at enhancing well-being. Therefore, TCR ambassadors stress the rationality of theoretical implications and the importance of the context in research and call it a social science that matters (Flyvbjerg 2001). To this end, TCR defines non-evident aspects of real-life situations and encourages a diverse paradigmatic approach.

While the main TCR mission is focusing efforts on making consumers' lives better (Gutmann 2012), there is no definite "formula" for research that leads to a guaranteed positive social change. It starts from identifying a consumer-centred problem, progresses to a theoretical contribution and concludes with the effective dissemination of findings (Mick et al. 2011; Ozanne et al. 2011; Ozanne, Mick, Pechmann, and Pettigrew 2015). Structurally, TCR suggests its six defining features and four envisionments that are related to the research stages of the current study (as shown in Table 2.2.1). This approach forms a TCR "pathway" to move beyond a traditional research framework, to create socially valuable knowledge.

Table 2.2.1 TCR Defining Features and Envisionments for the Current Study

Research Stages	TCR Defining Features	TCR Envisionments	Difference From Traditional Research	Current Study
Problem identification and research team	<ul style="list-style-type: none"> - To improve well-being; - To examine social problems in the context 	Practical wisdom	Exploring significant social problems by focusing on consumers, first of all. Transforming the knowledge in practical consumer wisdom. Encouraging a multi-perspective approach and involving transdisciplinary teams.	Placing excessive social media users at the centre of the research. Drawing on the multi-paradigmatic approach by integrating research domains of consumer behaviour, psychology and business ethics within the TCR framework.
Data gathering, analysis and interpretation	<ul style="list-style-type: none"> - To encourage paradigm diversity; - To employ rigorous theory and methods 	Theoretical contributions	Fostering multiple research concepts and paradigms. An innovative approach to the research design by using a broader set of relevant data measuring and collection techniques. Contributing theoretically to the current field of knowledge in the pursuit of positive social changes.	Joining implicit and explicit measurement from different research fields. The conceptualisation of the underlying mechanism of excessive social media use as a theoretical contribution to the body of dual-system and self-control theories.
Research Dissemination	<ul style="list-style-type: none"> - To partner with consumers and their caretakers; - To disseminate findings to relevant stakeholders 	<ul style="list-style-type: none"> - Social change agents; - Alternative communication strategies 	Disseminating research by various communication channels beyond the academic community, e.g. non-academic public institutions, mainstream media and digital platforms. Encouraging the use of a variety of communication channels to show the results of studies to improve consumers' well-being.	Communicating the results of this study beyond academia for non-academic stakeholders, cooperation with the city councils and high schools. Disseminating research results among academics who are social media users themselves.

Note: adapted from, Mick et al. (2011, pp. 6-9) and Crockett et al. (2013, p. 1172).

Importantly, the TCR approach substantially correlates with studies on business ethics which focus both on consumers and business companies. Hoffman and Moore (1982) suggest avoiding the casuistry in interpreting business ethics. This happens when generic moral rules or principles are applied to all business companies in various domains. Researchers explain that business ethics is rather a thoughtful reflection on the nature and the context of the business in each particular case. Furthermore, they claim that business ethics is about mutual expectations and responsibilities of business and society. Brenkert (2019) explores the challenges of business ethics nowadays and stresses on the gap between the theoretical conceptualisation of business ethics and a real life practice.

The logical question would be why the business needs to change priorities in favour of boosting consumers' welfare in the first place. The main reason is that an unethical business approach leads to negative attitudes of consumers who may decrease or terminate their consumption (Govind, Singh, Garg, and D'Silva 2019; Román and Cuestas 2008). Though following business ethics may be considered as a constraint of profitability, researchers (McMurrian and Matulich 2016) remind about the business reputation and its impact on the success in the long-term. This makes business companies strive for a positive ethical image for their brands so as not to lose the loyalty of consumers (Inoue and Kent 2014; Singh, Iglesias, and Batista-Foguet 2012). In this regard, numerous findings on the impact of excessive social media use on well-being can hardly be ignored both by users and businesses. However, it is hardly possible to define ethical norms for this business area without a deep understanding of the underlying mechanism of social media use. To address this gap, this study draws on the main features of TCR and investigates what constitutes excessive social media use, first of all. Going further, the TCR framework and its envisionments enable this research to join various

aspects of social media use with the reflection on ethical concerns about exploiting vulnerabilities of excessive users.

In line with the described approach, this study analyses the pros and cons of routinised social media use by placing excessive social media users, rather than social media sites, at the centre of the research. Drawing on the TCR framework, this research aims to create a theory-based, user-centric framework that can predict other excessive digital activities and contribute to the fields of consumer behaviour and business ethics. Being challenged by one of the TCR missions on the dissemination of research findings, this work aims to produce valuable suggestions for excessive users as well as for social media companies and public policy makers. For this, excessive social media and its impact on well-being are explored starting from the nature of all well-known excessive behaviours.

2.3 The Nature of Excessive Behaviours

Excessive Internet and social media use are often compared with other well-known substance and behaviour addictions such as smoking, alcoholism or gambling (Seymour 2019; Tiku 2018). *The Guardian* (2018) states that social media sites activate the “same brain mechanisms as cocaine” and compares them with slot machines. In the meantime, researchers (Andreassen et al. 2012; Kuss and Griffiths 2011b; Turel and Qahri-Saremi 2017) explore if excessive social media use meets core criteria of other addictive behaviours. They provide empirical evidence for excessive social media users to experience common symptoms which are associated with substance-related and some behavioural addictions such as withdrawal, mood modification, salience, relapse, tolerance and conflict. Adding to this, Young (1998) explains that excessive use of new technologies shares similarities with symptoms of well-known pathological behaviours such as alcoholism, eating disorders, and gambling. Addicted social media users even

experience the same brain alterations that people with substance abuse and gambling experience (He, Turel, and Bechara 2017). In overall, researchers (Kuss and Griffiths 2017) describe several theoretical frameworks which interpret addictive social media use as a result of low self-presentation skills, attempts to escape from daily problems such as loneliness and depression, or as a way to manage psychological issues such as neuroticism and emotional stability. To set a broad context for this study, exploring excessive behaviour from various perspectives is therefore essential. This review aims to provide knowledge that expands our understanding of excessive behaviours regardless of the context.

2.3.1 Defining Excessiveness in Behaviour

Most of the literature ties excessiveness to known concepts of addictions, which has aroused argument over whether the term “addiction” is legitimate for all excessive behaviours, as not all of them are included in the Diagnostic and Statistical Manual of Mental Disorders (DSM-5) (Pies 2009). The same discussion is relevant to excessive social media use (Kuss and Griffiths 2017). In defining “excessiveness”, Gilbert (1976) suggests that substance use itself is not detrimental; rather, it becomes excessive when it interferes in daily life and damages the ordinary performance of the organism or mind. A relevant illustration for this could be overeating. While eating itself is an essential need for human health and well-being, excessive eating is defined by the amount of food which is not required nutritionally and results in problems for health (Wardle 1990).

In the same way, excessiveness in the context of social media can hardly be interpreted by the amount of consumption only, i.e. time spent on social media, a number of social media contacts or quantity of social media “likes” placed in a given day. As Gilbert (1976) suggests, the activity itself is not harmful. Contrariwise, social media provides

users with unique innovative opportunities for online communication and raising self-esteem (Hoffman 2012; Radovic, Gmelin, Stein, and Miller 2017; Valkenburg, Peter, and Schouten 2006; Verduyn et al. 2017; Weinstein 2018). Adding to this, Naslund et al. (2017) demonstrate promising results on changing excessive smoking behaviour using social media interventions. In the meantime, similar to other excessive behaviours, beneficial social media use becomes harmful at a certain point in time. For this reason, excessive use of social media is interpreted as an activity which intrudes on daily routine and leads to problems for personal well-being (Morrison and Gore 2010; Olufadi 2016; Pontes, Szabo, and Griffiths 2015b; Weinstein and Lejoyeux 2010). Accordingly, beyond absolute measurements of time, social media use must be estimated by the quality of time spent on it (Caplan and High 2006; Olufadi 2016).

Considering possible similarities between various types of excessive behaviours, this investigation cannot be restricted to excessive social media use only. Therefore, the following sections attempt to reveal existing interpretations of other excessive behaviour beyond social media use. Being aimed at finding out commonalities of excessive behaviours in different research domains, this study briefly investigates the following main aspects for all of them. First, the current definitions for diverse excessive behaviours are explored. Then, this research looks into the approach to measure them. Finally, This work inspects the main conceptual aspects of this type of behaviour and checks if it is linked to other excessive behaviours.

2.3.2 Excessive Non-media Behaviours

A review of excessive behaviours, such as drinking, smoking, overeating, gambling, shopping, exercise and Internet use shows a lack of agreement over the conceptualisations within the topic (Mudry et al. 2011). Researchers explain that many authors either

develop their own definitions or are not specific about what terms and concepts of the excessive behaviour they rely on. In general, excessive behaviours are divided into substance dependence, such as smoking or eating, and behavioural or activity-related dependence, for example, gambling or exercise (Mudry et al. 2011).

2.3.2.1 Substance-related Behaviours

Drinking

Starting from the excessive use of substances, it is important to explore wide-spread excessive alcohol drinking, first of all. Researchers (Kuntsche, Kuntsche, Thrul, and Gmel 2017) highlight myriad short-term and long-term negative consequences of excessive drinking for personal and collective well-being such as health problems, impairment of job or academic performance, the incidence of injuries for self and others, violence and homicide, economic losses and others. Other studies (Esser, Clayton, Demissie, Kanny, and Brewer 2017; Siemieniako and Kubacki 2011; Skinner and Allen 1982) provide evidence for more damaging aspects for participants' health and well-being such as anxiety, depression, mental disorders, traffic accidents, alcohol-related violence and death. In the meantime, for many years there has been a conversation about the lack of terminology and standards for the measurement of excessive alcohol use (Skinner and Allen 1982; Wallace and Haines 1985; White and Hingson 2013).

Meanwhile, excessive or "binge" (episodic or occasional) drinking is defined by the number of drinks within the specified period, first of all (Esser et al. 2017; Kanny, Naimi, Liu, and Brewer 2020; White and Hingson 2013). To be more precise, the US National Institute on Alcohol Abuse and Alcoholism (NIAA 2004) insists on the definition of excessive alcohol use as more than four drinks for women and five drinks for men within two hours. However, Kubacki et al. (2011) explain that binge drinking cannot be defined

straightforwardly by large quantities of consumed alcohol only. Importantly, Kuntsche et al. (2017) highlight that occasional drinking may potentially result in heavy addictive behaviour. One of the most important studies in this research domain by Wechsler and Nelson (2008) was conducted on more than 50,000 students from 120 colleges to reveal high-risk groups among occasional drinkers. Researchers highlight that reduced cognitive performance occurs at low levels of drinking and, therefore, public policies preventing alcohol dependence need to focus on lower drink groups. This standpoint is supported by one of the studies from a well-known longitudinal Dunedin research (Meier et al. 2016b) which observed the same cohort of participants for more than 38 years starting from their birth. Researchers claim that persistent alcohol dependence of parents and occasional drinking habits in adolescence are accurate predictors of persistent substance dependence and excessive consumption in adulthood.

In parallel, researchers (White et al. 2005) emphasise another crucial aspect of excessive alcohol drinking. Their study on college students reveals a noticeable discrepancy between self-reported versus the actual size of consumed drinks. Investigators suggest that consumers can underestimate their consumption levels, and, therefore, more people can experience excessive behaviours than is defined by surveys. The same finding is proposed by Northcote and Livingstone (2011). Participants were asked about how much alcohol they consumed in a bar at the end of the evening. Participants with excessive use of more than eight drinks underestimated their consumption noticeably in contrast to moderate drinkers. Researchers (Northcote and Livingston 2011) state that the self-report method is potentially relevant for light drinkers while the excessive use of alcohol needs to be measured with alternative tools to collect accurate data and not to mislead other investigators. The same trend of underestimating consumption levels may be relevant for other excessive behaviours. In this way, consumers may not perceive their consumption

as unhealthy and downplay a possible impact of excessive behaviour on their personal well-being. A possibility of a similar bias is explored in this study for excessive social media users too.

To interpret the underestimating of personal excessive consumption, academics (Caswell, Celio, Morgan, and Duka 2016; Skinner and Allen 1982) highlight that impulsiveness is one of the important aspects of alcohol dependence syndrome. In this connection, alcohol dependence scales include questions on the lack of behavioural control and compulsive drinking beyond the absolute measures of drinking consumption. Finally, researchers (Siemieniako, Rundle-Thiele, and Kubacki 2010; Skinner and Allen 1982) stress the importance of the research analysis by using different measures and techniques such as self-report, interviews and measures of real-life behaviour. Lastly, it is interesting how some investigators (Wallace and Haines 1985) combine excessive drinking measurements with questions about excessive non-alcohol consumption such as smoking or exercise. In this way, they explore if one type of excessiveness is linked with other excessive substance or activity-related behaviours.

Smoking

Excessive smoking has a lot in common with excessive drinking in terms of its impulsive nature and measurements (Hitsman et al. 2010). Similar to drinking, researchers use an impressive range of diverse measures of excessive smoking starting from a self-reported or actual number of cigarettes or tobacco consumed per day, per month or lifetime (Biener and Albers 2004; Godtfredsen, Prescott, Vestbo, and Osler 2006), smoking patterns such as frequency of tobacco consumption (Biener and Albers 2004; health.govt.nz 2020), health outcomes of tobacco smoking including toxin exposure or level of disease risk (Bjartveit and Tverdal 2005; Hatsukami, Benowitz, Rennard, Oncken, and Hecht 2006;

Husten 2009), intentions to quit smoking (Fagan et al. 2007) and others. Moreover, researchers differentiate between medium and high smokers (Godtfredsen et al. 2006), light and intermittent smokers (Husten 2009), occasional and social smokers (health.govt.nz 2020), or active and passive smokers (Hull, North, Taylor, Farrow, and Ford 2000; Makin, Fried, and Watkinson 1991). However, Florescu et al. (2009) stress on a lack of ideal measuring tools for accurate assessment of tobacco excessive use and exposure. To address this concern, some researchers adapt drinking scales to measure excessive smoking behaviour and join the absolute measures such as smoking history with excessive smoking and efforts to control it. For example, Orleans et al. (1991) join the measures of the amount of smoking with various self-control measurements such as a desire to stop this unhealthy habit, previous attempts to stop smoking and personal efficiency in quitting.

Another important self-control aspect of this excessive behaviour is explained by Hitsman et al. (2010). Academics show that many smokers report a wish to quit this unhealthy habit but experience great difficulty in doing so despite the harm from smoking. One of the authors of the Strength Model of Self-control (Baumeister, (2017), explores excessive smoking behaviour from the perspective of free will. The researcher concludes that smokers have the potential to get rid of this unhealthy behaviour, however, a strong motivation is needed. Adding to this, one of papers from a known longitudinal Dunedin study (Robertson, Iosua, McGee, and Hancox 2015) suggests that non-daily smokers report themselves as non-smokers at the age of 21; however, just 4% stay non-smokers and only 13% are non-daily smokers by the age of 38. This finding demonstrates the ability of harmful habits to transform from occasional use to excessive behaviour invisibly for smokers themselves.

Interestingly, another study by Brit et al. (2013) provides evidence of the interactions between smoking and drinking. They claim that excessive cigarette consumption causes a higher level of drinking comparing to consumption among non-smokers. It can be assumed that these two types of excessive substance use have many similar aspects in terms of their nature. Meanwhile, the finding that one excessive behavioural activity can cause another one is important to explore for excessiveness in different areas.

Overeating

As eating is an essential need for human health and wellbeing, excessive eating can be defined by the amount of food which is not required nutritionally. Therefore, researchers define excessive eating by diverse measures and tools including body-mass-index (BMI) and weight-related characteristics (Ackard, Neumark-Sztainer, Story, and Perry 2003), food cravings (Meule 2013), patterns of food consumption, i.e. dieting, eating to escape from stress, night eating or binge eating (Ackard et al. 2003; Davis et al. 2011; Meule 2013; Strimas et al. 2008) and others. Bąk-Sosnowska (2017) investigates the differential criteria of binge eating disorder in detail. The researcher concludes that it is a multifaceted phenomenon and suggests that it can be diagnosed by a number of measures such as amounts of food, loss of control, failures in changing this unhealthy behaviour, manner of eating, impulsivity and emotional imbalance. In support, Meule (2013) highlights that attentional impulsivity, or inability to focus quickly, results in responses to food stimuli, and it is consistently associated with overeating. In this vein, Wardle (1990) differentiates two types of excessive eating based on different environmental contexts. The first type is “external eating” which is triggered by external stimuli while the second one is “emotional eating” which results in emotional arousal. Scholars highlight the underlying impact of both external and internal stimuli on excessive eating. They claim that certain

type of stimuli imitate the feeling of real hunger and lead to excessive eating both on the physiological and emotional level. In spite of another origin, this perspective may be considered to explore the impact of multiple social media stimuli on its excessive use.

With regard to measurements, many researchers consider both the amount of food and eating patterns when defining excessive eating. For this, they join items relating to planned and non-planned behaviour. For example, the scale of Three-Factor Eating Questionnaire (Davenport, Houston, and Griffiths 2012; Karlsson, Persson, Sjöström, and Sullivan 2000) includes conscious and non-conscious uncontrolled eating, e.g. emotional eating. Importantly, the excessive eating scale does not include absolute measures of food amounts but rather measures of how frequently certain eating behaviour occurs and the impact on the participants' well-being.

2.3.2.2 Activity-related Behaviours

Physical Exercise

Davis et al. (1993) describe the excessive exercise as an “activity disorder”. The researcher proposes common characteristics of excessive exercise and eating such as physical deprivation and control. Peluso and Andrade (2005) explain that in spite of all the benefits of physical activity such as improvements in health, therapy for depression and anxiety, physical exercise can also be disadvantageous when fulfilled in a wrong or excessive way. Going beyond the physical limits of the body, excessive exercisers experience sleeplessness, loss of appetite, reduced libido and emotional decline. Researchers call it an overtraining syndrome which is reminiscent in some cases of the exhaustive excessive use of social media (Power et al. 2017; Woods and Scott 2016). As expected, the definition of excessive physical exercise includes absolute measurements first of all. Davis et al. (1993) conduct a study on women and define excessive exercisers

as those who undertake an hour or more of training at least six times per week in certain activities such as swimming, running, skating and others. Researchers measure the excessiveness of exercise for the sampling as a ratio between its duration and frequency. The frequency approach is also used by Mond et al. (2009) who insist on the connection between excessive eating and excessive exercise and define excessive physical activity as an intense exercise at least five days a week. However, in parallel with the cut-off for this unhealthy behaviour, academics explain that physical activity becomes excessive when it is held at inappropriate times or interferes with other important daily activities significantly. This approach to defining excessive exercising has common features with both substance-related and other activity-related behaviours.

Finally, researchers (Mond and Calogero 2009; Peluso and Andrade 2005) link excessive exercise to personality traits and highlight the impact of this behaviour on well-being. Similar to the nature of other behaviours, researchers conclude that while medium physical activity improves mood, excessive exercise can be related to mood decline, depression and anxiety. Eventually, they call it “a depression with a new face” (Peluso and Andrade 2005, p. 65).

Excessive Shopping

Exploring excessive social media use from the consumer behaviour perspective, this study cannot omit excessive buying behaviour in this study. Dittmar et al. (2000) refer to excessive buying as an impulsive behaviour claiming that this type of shopping activity excludes self-control. In contrast to eating, buying is not an essential activity for human life. Therefore, it is analysed by relative rather than absolute measurements of the number of purchased goods. For example, items relate to a loss of control, e.g. “I have often bought a product that I did not need even when I knew I had very little money left”

(d'Astous, Maltais, and Roberge 1990; Faber and O'guinn 1992). Going further, researchers (Dittmar and Drury 2000) explore the difference in the behaviour of ordinary versus excessive buyers. They introduce an interesting finding that excessive buying may be interpreted by drawing on compensation strategies (Dittmar and Drury 2000). In other words, excessive shoppers tend to buy more goods which relate to aspects they lack in their real life. This conclusion sounds close to other types of excessive behaviours including social media use when consumers replace important daily activities such as socialising with easily achievable online behaviours. In this manner, excessive buying describes a distortion of human needs and values as an underlying mechanism of impulsive shopping behaviour.

Though I explore excessive buying as a non-media behaviour, I cannot omit the recent rapid distribution of online buying. Aragoncillo and Orus (2018) explore the mechanism of self-control for online buying behaviours. For this, academics compare the behaviour of impulsive offline and online buyers. Researchers reject previous findings on rigorous planning as a way to control online shopping behaviour. They stress that encouraging factors for online buying such as easier payments and a greater variety of goods, foster the impulsivity as well. Finally, researchers (Davenport et al. 2012) report the connection between impulsive and excessive buying behaviours with other problematic behaviours such as excessive eating and others.

2.3.3 Excessive Screen Media Behaviours: occasionally they sleep

2.3.3.1 Defining Excessive Screen Media Use

Beyond the traditional split for excessive behaviours into substance and activity-related, recent studies (Sigerson, Li, Cheung, and Cheng 2017; Sussman and Moran 2013) differentiate another branch of excessiveness that involves new technologies such as

television, Internet, online gaming, smartphone use and social media. They categorise these addictions as “information technology or technology-related behaviours”, which, though broad, recognises one similar characteristic: screen use (Marshall, Gorely, and Biddle 2006; Schmidt et al. 2012). The current study follows researchers who propose the use of new technologies as “screen media use” and exploit this term to define the broad range of behaviours related to the media and digital activities (Bickham, Blood, Walls, Shrier, and Rich 2013). This term clearly defines the range of behaviours that are explored in this research. Also, this approach prevents the study from misinterpretations of the definitions of information, technology, online and others. At the same time, this chapter explores both excessive screen media and social media use. Both of them are investigated in connection with one another because social media belongs to the family of screen media behaviours. At the same time, this research outlines some uncommon features of excessive social media use and discusses the possible reasoning for this.

When exploring screen media use, the current investigation cannot omit the impact of this behaviour on the daily life of the majority of the world population. According to recent 2019 reports from Nielsen (O'Brien 2020), US users older than 18 years old spend 11 hours 54 minutes daily being connected to some form of digital media content via desktop computers, smartphones, tablets and other devices. This time duration has increased by 1.5 hours compared to the third quarter in 2018. Ironically, researchers say of their respondents that “occasionally they sleep”. Academics explain this growth as being due to the fast development of new technologies and their sophisticated approach. Social media demonstrates similar trends (Wearesocial.com 2019). Someone who starts using social media, let's say, at 13 and lives to 75, would spend more than six full years on Facebook and Instagram accounts. Having the same 24 hours in a given day, this amount of time on screen media and social media use decreases the involvement in other

daily activities which is hardly managed by users. In this regard, *The Guardian* (2018) compares the impact of social media use with heavy drugs and gambling. Therefore, this thesis attempts to explore if screen media and social media use share the same commonalities as other excessive behaviours as described in the previous chapter.

2.3.3.2 Television

According to the U.S. Bureau of Labor Statistics (Statistic 2018), watching television is one of the primary leisure activities which takes up 2.84 hours or almost 12% of the daily time of an average American, 15 years of age and older. It takes third place after highly necessary activities such as sleeping (8.82 hours) and working (3.23 hours). Kubey and Csikszentmihalyi (2002) confirm that the term excessive or addictive television (TV) watching cannot be precise because of its nature. They explain that this type of addictive behaviour is often linked to substance-related addictions which are impulsive in their nature. Researchers do not reject the impulsivity of this behaviour and reveal that people watch television longer than they intend to.

To measure excessive television watching, Horvath (2004) introduced the Television Addiction Scale. In this scale, factors of addiction such as tolerance and withdrawal are complemented by self-reported items on the time spent and displacement of other activities. Noteworthy is the fact that the researcher experienced difficulty in recruiting participants for the study due to a bias in self-reporting own addiction to the television. It appeared that people could not define if their watching of television interferes with other life priorities. To address this issue, the investigator recruited excessive watchers based on the opinion of their close circle of family, friends and colleagues.

Sussman and Moran (2013) call television watching a “hidden” addiction and list a battery of negative consequences for personal well-being, such as increased aggression,

damaged personal and family relationships, lower academic and working efficiency, poorer body look and higher body mass index, sleep issues and even shorter living age. Researchers confirm that excessive television watchers experience temptations to continue watching even when they are limited in this activity by others or by themselves. Academics consider the impact of excessive television watching on well-being and lack of self-control, and, therefore, conclude that this excessive behaviour can hardly be measured by the frequency and duration of watching only. The watching time which may be harmful to some people but beneficial for others. This sounds similar to examples about professionals from Caplan and High (2006). Though, let's say, digital marketers work online for several hours daily, they yield from this amount of use rather than suffer from it.

Finally, similar to non-media behaviours, television is linked to other problematic and excessive behaviours. For instance, Bener et al. (2011) suggest that excessive television viewing and excessive Internet use are linked to possibly obesity among children and adolescents; Sussman and Moran (2013) talk about the probable impact of excessive television watching on increasing purchasing behaviour and smoking, and Kubey and Csikszentmihalyi (2002) suggest that the main principles of addictive television watching may be applied to computer games as well.

2.3.3.3 Internet Use

Nowadays, nobody doubts the benefits of Internet use such as increased academic and job performance, decreased loneliness and depression (Spilkova, Chomynova, and Csemy 2017). However, the many dark sides of problematic Internet use are known to users too. The consequences of excessive use include but are not limited to irritability, nervousness, lack of sleep, lower self-esteem, loneliness, anxiety, difficulties with

focusing and time management, attention deficit and low self-control, damaged relationships and decreased performance and others (Anderson, Steen, and Stavropoulos 2017; Banjanin, Banjanin, Dimitrijevic, and Pantic 2015; Morrison and Gore 2010). These possible harmful aspects of excessive use are explored by many studies to define antecedents of this behaviour and potentially decrease this harm. In the current literature, special attention is paid to the vulnerability of adolescents to excessive Internet use, whose brains are not yet ready to resist this amount of temptation (Anderson et al. 2017; Blinka et al. 2015; Helsper and Smahel 2019; Volkow, Koob, and McLellan 2016; Vondráčková and Gabrhelik 2016).

In the meantime, researchers (Anderson et al. 2017; Helsper and Smahel 2019; Spilkova et al. 2017) confirm ongoing debates on various labelling of problematic Internet use that may also be described as addictive or pathological Internet use, online addiction and Internet addiction disorder. Blinka et al. (2015) suggest drawing on the term excessiveness as soon as the unhealthy Internet use does not match all the criteria required by the Diagnostic and Statistical Manual of Mental Disorders, DSM-5 (Association 2013). Though it can be labelled in different ways, Internet use is considered to be excessive when it results in impairments and detrimental consequences for physical and mental well-being (Vondráčková and Gabrhelik 2016).

Expectedly, important predictors of excessive Internet use are impulsivity and lack of self-control (Anderson et al. 2017; Cao, Su, Liu, and Gao 2007; Chamberlain, Ioannidis, and Grant 2018). Lee et al. (2012a) conceptualise excessive Internet use as an impulse control disorder and claim that impulsivity needs to be investigated as one of the main antecedents of this unhealthy behaviour. Adding to this, Helsper and Smahel (Helsper and Smahel 2019) outline that users with poor digital literacy become the most vulnerable

for excessive Internet use and its negative consequences. In other words, this type of users either are not aware of the problem itself or do not have enough knowledge to manage the problem and benefit from Internet use.

The lack of agreement on terms and concepts for excessive Internet use influences the research designs and methodologies used. Many studies draw on theoretical constructs and measurements for various known addictive behaviours. Therefore, scales for excessive Internet use are mainly based on similar or adapted measures of other addictive behaviours, for example, the Excessive Internet Use scale which measures factors of addiction, the Generalized Problematic Internet Use Scale and Young's Internet Addiction Test which joins factors of addiction and the impact on well-being, the Chen Internet Addiction Scale which evaluates five domains of Internet-caused problems and others.

Finally, researchers confirm the link between excessive Internet use and other known addictive behaviours. For example, Lee and Lee (2017) provide worrying evidence of the connection between Internet use and other excessive non-media behaviours for young adults. In their longitudinal study, they report that high Internet use at the age of 15 was a significant predictor of excessive smoking and drinking behaviours at the age of 20. In a similar manner, Internet use is linked to eating disorders (Tan et al. 2016), Internet gambling (Tsitsika, Critselis, Janikian, Kormas, and Kafetzis 2011) or impulsive buying behaviours (Lee, Park, and Bryan Lee 2016)

In addition to all the current findings, Blinka et al. (2015) emphasise the crucial importance of defining segments of excessive users as each of them may have own patterns of behaviour and need to be explored separately. This type of segmentation may result in a deeper understanding of how users from one segment transform into the other

by either increasing or decreasing their unhealthy behaviours. Other investigators (Anderson et al. 2017; Helsper and Smahel 2019) extend this suggestion and explain that psychological traits and characteristics may have a defining impact on the way the Internet is used. In this way, researchers are common in their claim that it is highly important to explore personal psychological vulnerabilities with regard to excessive Internet behaviours.

2.3.3.4 Online Gaming

Similar to other excessive screen media behaviours, online gaming, or “massively multiplayer online games” (MMO), or “Massively-Multiplayer Online Role-Playing Games” (MMORPGs) can have a dual impact on users. Researchers (Andreassen et al. 2016; Sublette and Mullan 2012) emphasise positive aspects of this behaviour, e.g. feelings of fun and achievement, friendship, connectedness and sense of community, entertainment, development of cognitive skills and others. At the same time, excessive online gaming is constantly linked to myriad harmful physical and psychological impacts on personal well-being such as social isolation, aggression, decreased academic and job performance, annoyance, sadness, restlessness, losing or gaining weight, headaches, social phobia, permanent lack of sleep, a decline in memory efficiency, fatigue and exhaustion (Dworak, Schierl, Bruns, and Strüder 2007; Gentile et al. 2011; Kim, Namkoong, Ku, and Kim 2008; Király, Griffiths, and Demetrovics 2015; Ko 2014; Sublette and Mullan 2012). When joined with the television, excessive television-game playing results in additional harmful side effects for players, in particular for the eyes (Tazawa and Okada 2001). Excessive television players underuse muscles around the eye which leads to chronic fatigue, black rings under the eyes, muscular stiffness in the shoulders and sleep deprivation. Beyond health aspects, Williams et al. (2008) emphasise

that online gaming can ruin the actual social and community life of players. However, problem gamers cannot control their excessive behaviour even when they understand how it interferes with their daily life (Király et al. 2015). Therefore, online gaming becomes excessive when regular gaming becomes harmful for daily life (Sublette and Mullan 2012). On top of this definition, online gaming disorder is the only digitally-related behaviour which is included in section three of the latest edition of the Diagnostic and Statistical Manual of Mental Disorder, DSM-5 as a behavioural addiction (Anderson et al. 2017; Király et al. 2015; Müller, Dreier, Beutel, and Wölfling 2016).

In the meantime, the current literature demonstrates ongoing disputes on the relatedness of excessive online gaming either to substance or activity-related addictive behaviours. Many investigators (Gentile et al. 2011; Ko 2014) link excessive gaming to substance abuse and, therefore, to impulsive behaviours and impulse control disorders. Others (Hellman, Schoenmakers, Nordstrom, and van Holst 2013) claim that problematic gaming differs from substance abuse in terms of its impact on the brain. In contrast to drugs, alcohol or tobacco, online gaming does not influence brain systems straightforwardly and, therefore, cannot provoke the same symptoms. However, researchers conclude that online gaming may differ from substance abuse in terms of its extent but not in its kind. In contrast to them, Kuss and Griffith (2012) explore online gaming addiction in depth and insist that harmful online gaming relates to activity-based rather than substance addictions. They explain that excessive gamers tend to be more obsessed with gaming rather than doing it impulsively.

A lack of conceptual agreement between researchers results in using both substance and activity-related addiction scales in regard to excessive gaming. In either case, the impact of excessive gaming on daily life can hardly be measured by absolute measurements of

time spent or games played. Expectedly, the majority of scales on gambling include impulsivity as one of its main measurements (Raylu and Oei 2002). Additionally, similar to excessive Internet use, researchers (Kim et al. 2008) stress the importance of individual characteristics on the vulnerability to problematic gaming behaviour. However, there is no one single acknowledged validated gaming addiction scale yet.

Similar to many other behaviours, the other disturbing aspect of excessive online gaming is its connection with other addictions. Blinka et al. (2015) explore excessive Internet use and claim that highly excessive Internet users prefer online gaming as their main online activity and experience difficulties with self-control. Therefore, online gaming becomes a high-risk factor for excessive Internet use. Spilkova et al. (2017) report that excessive online gaming is linked to daily smoking. Seay and Kraut (2007) link problematic gaming to eating disorders, drug abuse and pathological gambling.

The discussions in the domain of excessive online gaming seem to be endless. At the same time, in spite of all the possible harmful consequences, researchers attempt to find ways for users to benefit from online gaming. For example, exploiting online gaming for teacher preparation programmes (Disseler and Allen 2016), using online gaming to train the processing brain functions of elderly people (Nouchi et al. 2012), or as a way to speed up the process of second language learning (Chik 2014; Peterson 2010; Ryu 2013). This evidence shows that screen media use may potentially be transformed from being harmful to beneficial.

2.3.3.5 Smartphone Use

Excessive smartphone use has introduced lots of entirely new terms and definitions such as FOMO or “fear of missing out” or, in other words, a fear of missing important information (Wang et al. 2019); “phubbing” which means ignoring other people around

and focusing on one's smartphone (Chotpitayasunondh and Douglas 2016); nomophobia or a fear of not being able to use a smartphone (Mitchell and Hussain 2018) and others. In this regard, probably all of us have been witnesses of excessive smartphone use. Researchers list a great number of possible harmful consequences such as ruined professional and personal relationships, a deficit of attention, anxiety, loneliness, a decrease in social support and many others (Bian and Leung 2015; Bianchi and Phillips 2005; Clayton, Leshner, and Almond 2015; Herrero, Urueña, Torres, and Hidalgo 2019; Krasnova, Abramova, Notter, and Baumann 2016; Salehan and Negahban 2013).

Meanwhile, many studies focus on the impulsive aspects of smartphone use and smartphone notifications as the key driver for this (Bian and Leung 2015; Kushlev, Proulx, and Dunn 2016). Andrews et al. (2015) claim that people use smartphones impulsively and, therefore, they tend to significantly underestimate the frequency of smartphone uses during a day. Sometimes, users do not even realise that smartphones are interfering in their daily routine so deeply. Clayton et al. (2015) call smartphones the extension of our physical and cognitive selves. Researchers report that separation from phones, i.e. not being able to respond to phone stimuli, results in increased heart rate, anxiety and unpleasantness. Excessive smartphone users confess that they would rather refuse from food for the whole day rather than from smartphone use (Goswami and Singh 2016). Furthermore, Ward et al. (2017) report, alarmingly, that even the mere presence of smartphones decreases the cognitive abilities of an individual and call it a "brain drain". Smartphones have an impact on cognitive capacity even when in a silent mode or placed face down. In this regard, together with understanding the harmful consequences of excessive smartphone use, it is not less important to explore how this use becomes so excessive.

Similar to other excessive screen media behaviours, smartphone use is measured through addictive substance and activity-related scales such as the Mobile Phone Problem Use Scale (MPPUS) (Bianchi and Phillips 2005), smartphone addiction criteria by Bian and Leung (2015) and Smartphone Addiction Inventory (Lin et al. 2014). In their review on mobile phone addiction, Goswami and Singh (2016) confirm just a few current validated scales to define mobile phone addiction. Beyond the abovementioned tools, Mobile Phone Dependence Questionnaire (MPDQ) (Toda, Monden, Kubo, and Morimoto 2004) and Mobile Phone Involvement Questionnaire (Walsh, White, and Young 2010) are also described as scales based on addiction criteria. In the meantime, Problematic Mobile Phone Use Questionnaire (PMPUQ) (Billieux, Van der Linden, and Rochat 2008) is a multidimensional measure which includes items on dangerous use, prohibited use and financial issues beyond dependence criteria. In overall, by factors being measured, almost all of measures are either adapted from or very similar to Internet addiction scales.

Smartphone use is also linked to other well-known problematic behaviours such as eating disorders (Tan et al. 2016) or Internet addiction (Ayar et al. 2017). Adding to this, Gregoire (2015) provides evidence that smartphone users struggle to report the actual duration of their daily smartphone use. Participants of that study use smartphones twice as much as they think. In the meantime, there is another aspect of the connection between smartphone use and other excessive behaviours which is worthy of attention. Some problematic behaviours are enhanced by using smartphones which increases the negative impacts on personal well-being. For example, using social media via smartphones is a significant predictor of smartphone addiction (Salehan and Negahban 2013). Another example relates to online gaming via smartphones. Playing an extremely popular smartphone game Pokémon Go is a reliable predictor of an increased risk of injuries, violence, kidnapping, car accidents or even death (Serino, Cordrey, McLaughlin, and

Milanaik 2016; Sharwood 2017; Wagner-Greene et al. 2017). When joined with smartphone use, other excessive behaviours seem to blend with real-life and become more interfering and problematic. In spite of all the advantages, the 24/7 access to smartphones merges screen reality with daily activities which may potentially blur the borders between various excessive behaviours.

2.3.4 Commonalities of Excessive Non-media and Screen Media Behaviours

Although the origins of excessive non-media behaviours related to substances and activities and screen media use, and excessive screen media behaviours are different, all are similar from at least four perspectives.

2.3.4.1 Impulsivity

First, excessive non-media behaviours are often conceptualised as an impulse control disorder (Grant and Chamberlain 2014; Liu and Potenza 2010; Shapira et al. 2003). Researchers interpret it as a failure to oppose impulsive responses that may be harmful to self or others (Mudry et al. 2011); or as a failure to learn from negative experience acting on the spur of the moment (Davenport et al. 2012). Either way, impulsive actions are described as antecedents of excessive non-media behaviours. For example, impulsivity predicts alcohol consumption for adolescents (Caswell et al. 2015); the same impulsive behaviour anticipates the failures of obese people to restrict themselves in food even when they are not hungry (Davenport et al. 2012); excessive buying is related to impulsive behaviour when impulsive shoppers experience difficulties in stopping themselves from buying, in spite of later regrets about money spent (Dittmar and Beattie 1998; Dittmar and Drury 2000). Following this conceptualisation, Skinner and Allen (1982) measure excessive non-media behaviour by including items on the lack of behavioural control when facing temptations or stimuli.

The same common feature of impulsivity is described as an antecedent of screen media behaviours as well (Caswell et al. 2015; Dittmar and Beattie 1998; Liu and Potenza 2010). Adding to this, excessive Internet use is suggested to be included as an impulse control disorder in the next revision of the Diagnostic and Statistical Manual of Mental Disorders (DSM-V) (Lee et al. 2012a; Liu and Potenza 2010; Pies 2009; Young 2009). At this point, it is important to differentiate between impulsive and compulsive behaviour. Compulsive actions are related to obsessive thoughts which appear in the mind, again and again, leading to the reoccurrence of unhealthy behaviour (Mudry et al. 2011). Though compulsivity is considered to be one of the facets of Internet addictive behaviours, users report that their excessive Internet use is more impulsive than compulsive (Liu and Potenza 2010). A similar finding on impulsivity relates to social media. Cudo et al. (2019) stress that impulsivity is one of the key predictors of social media addiction. Delaney et al. (2018) confirm the same relationship and explain that social media addiction shares impulsivity as a common characteristic with other known addictions. The connection between excessive social media use and impulsivity is also justified at the morphological level (Turel et al. 2014).

2.3.4.2 Impact on Well-being

Second, excessive non-media behaviours are similar in their detrimental impact on the quality of life which may lead to anxiety, depression and mental disorders such as depression, lower study and job performance, decreased self-esteem, feelings of intense guilt, broken relationships, health issues, injuries and problems (Anderson et al. 2013; Davenport et al. 2012; Farrell 2018; Lee, Chang, Lin, and Cheng 2014; Morrison and Gore 2010; Olczak-Kowalczyk, Tomczyk, Gozdowski, and Kaczmarek 2019; Skinner and Allen 1982; White and Hingson 2013). An activity or a substance may be not harmful

or even useful for an individual initially but becomes disadvantageous when used in an excessive way. For example, medium-level physical activity improves mood while excessive exercise goes beyond the physical limits of the body and leads to sleeplessness, loss of appetite and emotional decline (Peluso and Andrade 2005). Similar to other excessive behaviours, overtraining becomes excessive when it interferes with other important daily activities significantly or is held at an inappropriate time (Mond and Calogero 2009). Therefore, the same behaviour which is beneficial for one individual may be detrimental and harmful for another. However, little is known about defining the starting point for this transformation from healthy to problematic.

The same commonality of having a damaging impact on well-being relates to screen and social media as well. Recently, a number of studies have linked the excessive use of the Internet and social media to negative consequences for users' well-being (Andreassen 2015; Andreassen et al. 2016; Morrison and Gore 2010; Pontes et al. 2015b; Weinstein and Lejoyeux 2010). However, a number of other papers provide evidence of multiple benefits from social media such as enhancing self-esteem, increasing social capital and boosting well-being (Berger and Buechel 2012; Burke et al. 2010; Gonzales and Hancock 2010). Therefore, this study investigates why and how the same social media tool which is linked to the promotion of well-being becomes harmful and problematic, and whether this transformation can potentially be reversed.

Therefore, considering that excessive behaviours are impulsive by their nature, on the one hand, and have a harmful impact on well-being, on the other, this study explores the following research question:

RQ1. What is the relationship between impulsive and excessive social media use towards poor well-being?

2.3.4.3 Multiple Excessive Behaviours

Third, researchers have found a relationship between various types of excessive behaviours. For instance, pathological gambling correlates with various types of substance abuse (Griffiths, Parke, and Wood 2002). Excessive smoking has a lot in common with excessive drinking in terms of its nature and measurements (Hitsman et al. 2010). Smoking may promote excessive alcohol consumption (Britt and Bonci 2013). In turn, excessive drinking may have a lot in common with impulsive overeating (Gilbert 1976). Women with experience of excessive exercise have a higher level of eating disorders (Mond, Hay, Rodgers, Owen, and Beumont 2004). All this evidence supports the claims of Lacey et al. (1986) for the existence of multiple impulsive behaviours in one person and explains that the nature of their symptoms is interchangeable. The above listed commonalities allow researchers to apply this knowledge in measurement tools. Some investigators combine measurements of excessive behaviours with similar characteristics on one scale, e.g. questions on excessive drinking include items on excessive non-alcohol consumption such as smoking or exercise (Wallace and Haines 1985). Meanwhile, others consider common features of different behaviours by converting scales for one type of excessiveness to another, e.g. Hitsman et al. (2010) transform a drinking scale to measure excessive smoking.

The same trend in the relationship between various excessive behaviours is highly relevant for screen and social media use. For example, researchers reveal that addictive television is associated with alcohol abuse, overeating, smoking and Internet use (Sussman and Moran 2013); excessive online gaming has a positive relationship with unhealthy Internet use (Blinka et al. 2015); while eating disorders positively correlate with smartphone use, excessive buying and exercise (Mond et al. 2004; Tan et al. 2016;

Verplanken, Herabadi, Perry, and Silvera 2005). These findings add more evidence for a claim on multiple impulsive or excessive behaviours. At the same time, they interconnect traditional excessive behaviours with screen and social media use which may possibly spread its impact one over another.

2.3.4.4 Ambivalence of Attitudes

Though impulsivity and excessiveness are different multifaceted constructs, they have certain aspects in common. Both are similar in terms of the imbalance between self-reported attitudes and real behavioural outcomes. Wilson, Lindsey and Schooler (2000) highlight that sometimes people cannot explain or do not even notice that their behaviour is not consistent with their conscious attitudes and beliefs. Such an imbalance between conscious intentions and actual actions can be observed in different types of excessive behaviours. For example, those addicted to drugs may feel depressed but continue ruining their lives with the substance they do not like to the same extent as before (Robinson and Berridge 2001). In the same vein, excessive smokers share their wish to quit this unhealthy habit but experience great difficulty in doing it despite the obvious harm (Hitsman et al. 2010). In yet another example (Talukdar and Lindsey 2013), individuals have an impulsive urge to overconsume unhealthy snacks, while underconsuming healthy ones, in spite of advocating for healthy eating behaviour. The same contradiction is observed between the reported attitude of consumers towards ethical products and their contrary purchase decisions in real life (Govind et al. 2019). As would be expected, participants in studies experience difficulties in reporting this contradictory behaviour. For example, excessive drinkers may underestimate the consumption level of alcohol (White et al. 2005). Facing such discrepancies of reporting, researchers may potentially rely on confusing findings as well.

Similar aspects of excessive behaviour are often linked to screen and social media use (Caplan and High 2006; Kuss and Griffiths 2011b). For example, researchers (Sagioglou and Greitemeyer 2014) are surprised by the finding that users continue to use Facebook even though their mood worsens each time they log on. Power et al. (2017) reveal that users wake up during the night to check a social media profile but understand that they feel exhausted the next day. Turel and Qahri-Saremi (2016) describe a paradoxical example of drivers who use social media while driving despite realising possible tragic consequences. In the same way, it may be challenging for users to report accurately on contradictions in their problematic behaviour. As an example, impulsive smartphone users respond to questions about the number of their daily smartphone checks and this self-estimated number is twice as low as the real one (Andrews et al. 2015). Impulsivity may potentially justify this kind of deviation in self-estimations. However, for some reason, investigations on social media rely mainly on self-reports (Frost and Rickwood 2017) which explore conscious attitude and intentional actions rather than impulsive responses. Caswell et al. (2015) warn that this approach is restricted by reliance on self-understanding which is biased by many factors and not always trustworthy. To address this discussion, this study aims to consider possible biases in measurements and cast some light on the inconsistency between conscious attitudes and impulsive behaviour in the social media context.

In overall, in spite of a lack of agreement on theoretical frameworks on excessive behaviours, researchers provide evidence of various similarities and overlapping tendencies. In this regard, it is important to investigate if the same similarities are relevant for excessive social media use. This investigation starts from exploring acknowledged theoretical frameworks for a possible interpretation of impulsivity in social media use.

2.4 Theories of Behaviour Change: Dual-system Theories

To explore the imbalance between conscious and non-conscious behaviour of social media users, this study draws on the theories of behaviour change, specifically dual-system theories. These theories describe a constant conflict between two interacting brain systems: controlled (reflective) and automatic (impulsive) (Evans 2006). The reflective system processes information and results in deliberate behaviour, while the impulsive system produces automatic behavioural responses. Strack and Deutsch (2004) clarify the main principles of the interaction between both. The reflective system appeals to explicit beliefs and it is flexible in terms of action; whilst the impulsive system is based on implicit associative links which are stronger and quicker in reaction. Kahneman (2011) interprets the same systems from the perspective of behavioural economics and calls them “slow and fast thinking”. This is why the faster impulsive system often suppresses the reflective which results in non-conscious behaviour. In this way, functioning only through the impulsive system leads to ongoing fast non-conscious responses. It explains behavioural issues such as impulse control disorder or addictions. In the same manner, the impulsive system sheds light on the antecedents of excessive behaviours. However, it is not obvious how to measure this known unknown.

The same dual-system concept is interpreted as a model of dual attitudes – explicit and implicit – towards the same object (Wilson et al. 2000). On the one hand, there is an explicit attitude which is conscious and manageable; while, on the other, there is an implicit attitude which is a cognitive association that acts much faster and leads to non-conscious responses. When both attitudes have the same valence, the behaviour can be explained by explicit attitude only. If this is not the case, comprehending an inconsistency between conscious attitudes and real-life actions may be challenging. Therefore,

measuring attitudes may appear to be complicated and not so straightforward. In other words, attitude evaluations may not be reliable if they are measured with unidimensional scales. To address this issue, Greenwald et al. (2002; 1998; 2003) extend the description of implicit attitudes. They interpret implicit attitudes as associations which are activated by repetitive external stimuli. Researchers introduce the Implicit Association Test (IAT) to measure the relative strengths of non-conscious automatic associations. In this way, IAT makes it possible to compare implicit and explicit attitudes towards the same concept and draw conclusions on the prevalence of impulsive or reflective behaviour.

Inspired by this methodological opportunity, this study is guided by the latest research evidence that excessive social media use operates through the impulsive system (Turel and Qahri-Saremi 2016, 2017). This work focuses on the impact of implicit attitudes on impulsive and excessive social media use. In this regard, the current research focuses on the following disputable question:

RQ2. What is the influence of implicit attitudes towards social media on its impulsive and excessive use?

In so doing, this study does not intend to cast doubt on previous studies with self-report measurements; rather, it is assumed that we do not have the full story yet.

2.5 The Impact of Self-control on Social Media Use

2.5.1 Theoretical Frameworks of Self-control

The next question that arises is whether excessive users can manage their problematic behaviours. Not everyone who uses drugs becomes addicted to them (Volkow et al. 2016); similarly, not everyone who uses social media does so unhealthily. In most studies, the determining feature of excessiveness is a loss of self-control when the behaviour

damages personal interests and values (Doebel, Michaelson, and Munakata 2017; Levy 2013).

The principal challenge to maintain self-control is that it requires a high level of mental resources, similar to a muscle, which can be depleted depending on the extent of cognitive efforts (Baumeister, Vohs, and Tice 2007; Muraven and Baumeister 2000). Going further, Baumeister (2019) introduces the definition of ego depletion. The researcher explains that various functions of the self depend on the limited amounts of energy a person has to monitor and control their own behaviour. In other words, cognitive efforts such as making decisions or the self-regulation of one type of activity result in lesser control of other activities until the energy is replenished again. In this way, the researcher interprets a wide range of automatic behavioural responses, i.e. impulsive behaviour and habits. Then, the final behaviour depends on the personal capacity of mental resources to manage daily activities. Following this logic, the self-control muscle must be trained to become efficient.

To understand if this could be possible, the longitudinal Dunedin study (Meier et al. 2016b; Poulton, Moffitt, and Silva 2015; Robertson et al. 2015) explores the self-control skills of a thousand respondents for over four decades. Doebel et al. (2017) explain that the lower self-control at an early stage may have a detrimental effect on well-being in the future. Researchers conclude that if the level of self-control is low and not trained, no frequency of substance use is safe. This conclusion is disturbing for all known excessive behaviours which start from the harmless substance use or activities. However, the same findings are not yet fully investigated for the context of screen media use.

At the theoretical level, low self-control is linked to impulsivity and strongly depends on the context (Baumeister et al. 2007; Doebel et al. 2017; Levy 2013). People with a lack

of self-control are guided by external stimuli. Then, they behave inconsistently with their own best judgements but cannot explain why. One straightforward example is impulsive buying, which is provoked by the shopping environment (Verplanken et al. 2005). As an example, imagine a woman who has a limited daily budget but purchases an expensive dress on the spur of the moment, though regretting it later (Mishra and Mishra 2010).

In general, the literature on behavioural economics has contributed substantially to a deeper understanding of the self-control mechanism in terms of impulsivity (Vuchinich and Heather 2003). The original neoclassical concept of *homo economicus* describes a rational agent with predictable decisions. However, researchers have revealed contradictions in human behaviour that cannot be solved by traditional economic models (Kanev and Terziev 2017; Trevisan 2016). Scholars have since placed actual humans, with their self-control failures, at the centre of research and provide a better prediction of economic behaviour. They frame the early economic theory of self-control and call it a two-self model (Thaler and Shefrin 1981; Vuchinich and Heather 2003). This model is noticeably reminiscent of dual-system theories. It describes two agents in one person: a planner who takes care of lifetime utilities and long-term usefulness, on the one hand, and a doer who acts impulsively and follows urges in the short run, on the other. The ultimate behaviour is a result of an impulse-driven battle or the conflict between multiple selves. This interpretation does not discount human rationality entirely; rather, it points out the limits of self-control (Kahneman 2011).

Behavioural economics contributes additional essential findings on self-control. In high-tension contexts, such as poverty, impulsive behaviour increases and diminishes the overall efficiency of self-control. Then, diminished self-control can spread to other areas of economic choice and results in devastating consequences such as over-indebtedness

(Gathergood 2012; Spears 2011). Therefore, if the muscle of self-control is weakened by any excessive behaviours, it diminishes the overall capacity for managing own behaviour and results in other types of excessiveness. This conclusion turns the traditional approach to self-control the other way around. It changes the direction of causality from excessive behaviours to self-control. Thus, self-control may be eroded by one particular excessive behaviour and is likely to lead to excessiveness in others, which results in multiple impulsive behaviours (Lacey and Evans 1986). This finding may potentially justify the correlation between various addictions including screen and social media use which is described in this chapter above.

2.5.2 Self-control on Social Media

Signs of similar erosion of self-control on social media use occur when it correlates with other evidence of low self-control. For example, the higher level of social media use is positively associated with a higher body mass index and higher debt on a credit card, which are characteristics of low self-control (Wilcox and Stephen 2013).

However, Turel et al. (2014) have offered more unexpected findings on how self-control on social media differs from other excessive behaviours. Morphologically, the impulsive brain system of excessive users operates similarly to the mechanisms of other addictions. At the same time, the inhibitory, or self-control, system of social media users is not damaged and functions as usual. In other words, excessive social media users react to stimuli impulsively but have the potential to inhibit it. Researchers claim that users may have a deficit of motivation to limit their excessive behaviour. Then, an additional assumption about the reasoning of this behaviour may be added. Andrews et al. (2015) claim that users struggle to report accurately on their problematic use. Therefore, it may be assumed that the lack of motivation is accompanied by a lack of awareness about the

problem. This assumption correlates with the literature on behavioural economics again. Gathergood (2012) provides evidence that people suffer from extreme financial burdens when low self-control is accompanied by a lack of financial literacy. It sounds like the muscle of self-control needs to be trained in parallel with a comprehension of problematic behaviour. Finally, recent findings of Baumeister and his theory of free will (2017) suggest that the willpower muscle is not fully exhausted. When self-control energy is depleted, people tend to spend the remainder on physical not mental activities. However, they still can apply self-control when being highly motivated. These claims give hope that self-control interventions on social media may be potentially efficient if designed in a theoretically grounded way.

In summary, having a robust theoretical conceptualisation of self-control in other research areas, there is a lack of a similar understanding for the social media context. In studies on social media, researchers either apply acknowledged theoretical frameworks or conduct self-control interventions without relevant theoretical grounding. Meanwhile, few studies stress the differences between excessive social media and other known problematic behaviours. This thesis follows the TCR framework and draws on rigorous theory and research methods. In this regard, the next research question aims to reveal the following:

RQ3. How is self-control conceptualised in the social media context in the current literature?

Despite all the revealed similarities or differences, the potential impact of self-control on managing excessive social media use is still not fully explored. As such, the last research question of this study is:

RQ4. What is the potential role of self-control in managing impulsive, excessive social media use and poor well-being?

2.6 Chapter Summary

This chapter provided the theoretical background for the main fields of interest in the current study. At the same time, this part of the thesis outlined the pathway from the main research aim and research objectives to specific research questions which were introduced sequentially.

To consider the extensive impact of social media on the daily life of billions of users (Wearesocial.com 2019), this review started with the TCR framework (Mick et al. 2011). This framework outlined the connection between consumer-focused problems, theoretical input and further spreading of results to transform consumer behaviour and boost well-being. TCR supported a diverse paradigmatic approach which is highly relevant for the social media context with the lack of acknowledged theoretical frameworks to interpret users' behaviour.

To address challenging TCR tasks, the second section of Chapter Two investigated the nature of excessive behaviours. In spite of a lack of agreement within this research field (Mudry et al. 2011), this investigation concluded that there are several commonalities between key types of excessive behaviours such as substance and activity-related, screen media and social media use. Having different origins, all excessive behaviours were interpreted by measuring both the absolute measurements of use or activity and the impact of this behaviour on life values and personal well-being (Olufadi 2016; Wardle 1990). Beyond this, several principal commonalities were identified. All excessive behaviours are similar with regard to the impulsivity, deteriorating impact on well-being and the overlapping of different types of excessive behaviours in one individual.

An additional important finding relates to the inconsistency between conscious attitudes and real behavioural responses of excessive users. This led the literature review to the next section on dual-system theories. The dual-systems concept (Evans 2006; Strack and Deutsch 2004) or model of dual attitudes (Wilson et al. 2000) interprets inconsistencies of human behaviour as an imbalance between the reflective brain system with its explicit attitude and the impulsive system with its implicit one. As soon as the implicit attitude and impulsive system are activated faster, the potential role of self-control may be challenging and questionable. To explore this background, the fourth section of this chapter investigated the conceptualisation of self-control in the current literature.

In spite of the thorough literature background on self-control in different research areas, there is a lack of conceptual papers on self-control in the social media context. In this regard, studies on behavioural economics provide a robust theoretical framework on self-control failures for other research areas. The two-self model (Thaler and Shefrin 1981; Vuchinich and Heather 2003) and conclusions on the possible impact of excessive behaviours on the overall capacity for self-control (Gathergood 2012; Spears 2011) modify the traditional approach to self-control. These findings are reminiscent of recent conclusions of studies on self-control on social media, though these assumptions are not supported with acknowledged theoretical concepts yet.

In summary, this chapter provided the following four research questions for this study:

RQ1. What is the relationship between impulsive and excessive social media use towards poor well-being?

RQ2. What is the influence of implicit attitudes towards social media on its impulsive and excessive use?

RQ3. How is self-control conceptualised in the social media context in the current literature?

RQ4. What is the potential role of self-control in managing impulsive, excessive social media use and poor well-being?

While RQ1, RQ2 and RQ4 relate to the conceptual framework of this research, RQ3 aims to provide an extended understanding of the conceptualisation of self-control on social media in the current literature. Therefore, this investigation starts with the literature review to address RQ3 and provide robust theoretical reasoning for RQ4. For this, the following chapter introduces Study One with the systematic literature review on self-control in the social media context.

At this point, it is relevant to specify the philosophical foundation for this research such as ontological and epistemological approach. This important step defines the nature and possible limits of revealed knowledge and how this knowledge is justified. Sobh and Perry (2006) explain that ontology describes the understanding of reality while epistemology highlights the relationship between research and reality. Whatever scientific paradigm is chosen, it inevitably impacts research design and justifies the use of certain tools and techniques in the methodology.

In the meantime, Aliyu et al. (2014) claim that quantitative studies exploit mainly positivist paradigm and a philosophical notion that reality is considered to be real and human behaviour is measured empirically. However, Healy and Perry (2000) extend the interpretation of scientific paradigms, specifically positivism, critical theory, constructivism and realism. For this, researchers suggest three elements such as ontology, epistemology and methodology, and six criteria, including ontological appropriateness, contingent validity, methodology trustworthiness and others, to judge on a relevant

paradigm. Drawing on their framework, this study is consistent with the key standpoints of realism that states that the reality is “real”, however imperfect and findings of studies are probably true (Aliyu et al. 2014; Peter 1992). In other words, the literature review of Chapter 2 reports a lack of theoretical frameworks interpreting the mechanism of excessive social media use. Therefore, this work aims to reveal significant relationships between key aspects of excessive social media use. However, any of these findings need to be tested in future studies and, therefore, the explored reality is “probabilistically apprehensible” which is highly relevant for realism paradigm (Healy and Perry 2000, p. 119).

Though this research exploits quantitative tools and techniques, the theoretical foundation of this exploration differs from the positivism because of two key reasons. First, this thesis considers theoretical gaps in the current literature on social media use and focuses on theory-building rather than testing the research model on big samples from the population which would be a common approach for positivism (Aliyu et al. 2014). Second, the rapid ongoing development of screen media technologies does not correlate with the main notion of positivism that the world follows unchanging rules (Aliyu et al. 2014). Similarly, the same technological progress hardly corresponds to the epistemological standpoints of interpretivists or constructivists that reality is constructed through human knowledge and understanding (Aliyu et al. 2014; Fletcher 2017; Healy and Perry 2000). Therefore, this work is guided by the interpretation of realism as an alternative to empirically measurable knowledge on the real world of logical positivism, on the one hand, and qualitative exploration and uncertainty of constructivism, on the other (Fletcher 2017; Peter 1992). However, given the research aim and research questions in this study a positivist approach has been employed to understand the

phenomena under investigation and the relationship between the various constructs being studied.

To define the pathway for this study, Table 2.6.1 joins this research aim, research objectives, research questions and study design with the theoretical and practical contributions for each of them.

Table 2.6.1 Overview of Research Aim, Objectives, Research Questions and Research Design

Research Aim	Research Objectives	Research Question	Theoretical Contribution	Practical Contribution	Research Design and Data Analysis Techniques
Investigate the impact of self-control on the underlying mechanism of excessive social media use and personal well-being.	1. To understand how self-control is conceptualised for the social media context in the current literature.	RQ3. How is self-control conceptualised in the social media context in the current literature?	The first known systematic literature review on current self-control theories which are applied in the context of problematic social media use. This review provides an understanding of recent tendencies in the conceptualisation of self-control and points out commonalities and differences in study design.	Understanding of theoretical reasons for the inefficiency of self-control interventions for excessive social media users.	Study One: Systematic Literature Review. Data is analysed through nine phases of the Systematic Literature Review by Gough (2007) including PRISMA selection technique (Moher, Liberati, Tetzlaff, and Altman 2009), the EPHPP Quality Assessment Tool (Thomas, Ciliska, Dobbins, and Micucci 2004) and the manual synthesis of evidence.
	2. To fill a theoretical gap on what constitutes the mechanism of excessive social media use and the impact of self-control on it.	RQ1. What is the relationship between impulsive and excessive social media use towards poor well-being?	Understanding of antecedents of excessive social media use resulting in poor well-being. Providing a deeper knowledge on the strength of the connection between impulsive and excessive social media use.	Practitioners would be able to decrease excessive social media use and poor well-being by manipulating impulsive social media use.	Study Two: Cross-Sectional Survey 1) Single-Category Implicit Association Test (SC-IAT) analysed via R software. 2) A self-reported survey conducted via Qualtrics and MTurk platforms For data analysis, the partial least squared structural equation modelling (PLS-SEM), or PLS path modelling, is applied. Data is analysed via SPSS and SmartPLS software.
		RQ2. What is the influence of implicit attitudes towards social media on its impulsive and excessive use?	Understanding the underlying reasoning for impulsive and excessive social media use. Theoretical and empirical justification of the impact of implicit attitudes towards social media use. Providing recommendations on the research design and measurements used when exploring excessive screen media behaviours.	Self-control interventions and educational programmes may become potentially effective when considering both explicit and implicit attitudes.	
		RQ4. What is the potential role of self-control in managing impulsive, excessive social media use and poor well-being?	A theoretical contribution to the body of knowledge on self-control in the social media context. This knowledge enables researchers to design theoretically-grounded self-control interventions.	All involved non-academic stakeholders would be able to focus on theoretically justified self-control techniques.	

3. To offer practical suggestions for excessive users, social media marketers and public policy makers to reduce the extent of excessive use and promote positive well-being. n/a

Providing practical recommendations for non-academic stakeholders and, therefore, contributing to the pragmatic TCR framework by drawing on the rigorous theory and methods.

Suggested practices are aimed to assist excessive social media users, social media marketers and public policy makers to enhance users' well-being and benefit from social media use.

Chapter 3. Study One: Systematic Literature Review on the Conceptualisation of Self-control in the Social Media Context

“... we seem to be talking about different things under the same label and talking about the same things under different labels”

– Bacon (1976, p. 59)

3.1 Introduction

Recent studies on social media (Sagioglou and Greitemeyer 2014; Turel and Qahri-Saremi 2016) provide evidence that users may feel guilty about neglecting their life values in favour of new technologies but cannot manage their behaviour. However, the latest self-control interventions for excessive users do not meet the expectations of the researchers (Franks et al. 2018; Loid et al. 2020; Stieger and Lewetz 2018). In spite of anticipations, interventions do not result in noticeable changes in the problematic social media use, or these changes are fleeting and arguable. The current study shares the concerns of researchers about excessive users not being able to control this part of their everyday lives. Therefore, there is a strong need for the analysis of current self-control theories and conceptual frameworks for social media use. This kind of review aims to clarify if acknowledged behavioural theories are applicable to the social media context or need to be reconsidered to increase the efficiency of self-control interventions. In this way, the findings of Study One are expected to provide more clarity on what theoretical mechanisms are involved in the process of managing personal behaviour on social media and add to the theoretical grounding of Study Two.

3.2 Background

3.2.1 Problematic Social Media Use

For the systematic literature review, it is important to consider possible differences in using definitions by researchers. As explored in the literature review of this study, excessive social media use is not limited to the time which is spent on it. Social media use becomes excessive when it interferes in daily life and impairs life priorities and values (Turel and Qahri-Saremi 2016). However, there is no acknowledged single term for this phenomenon yet. Depending on the nature of the exploration, researchers may name this

level of social media use as problematic (Cudo et al. 2019; Du et al. 2019; Whelan, Islam, and Brooks 2020) or addictive (Leng et al. 2019; Omar and Subramanian 2013). This research considers current discussions on the legitimacy of using a term of addiction with regard to screen media and social media use (Billieux and Van der Linden 2012; Delaney et al. 2018; Kuss and Griffiths 2017; Pies 2009). Though researchers (Andreassen et al. 2016; Griffiths et al. 2014) have contributed to justifying the association of excessive social media use with the main symptoms of substance-related addictions, this type of excessive behaviour is not included in the Diagnostic and Statistical Manual of Mental Disorders (DSM-5) yet. Therefore, this work tends to avoid debates on the appropriateness of this term. For consistency, the term of excessive social media use is employed in this review. At the same time, academics (Turel and Qahri-Saremi 2016) interpret the term problematic social media use in the same way as excessive in many studies. For this reason, this study includes the term problematic in parallel with excessive in certain cases in order not to paraphrase the findings of other research. However, to find diverse literature on this topic, this study draws on a variety of possible known variations of the same term in the literature search.

3.2.2 Theoretical Frameworks of Self-control

The literature evolves on self-control concepts to interpret the ability of individuals to manage their behaviour. For many decades, the Theory of Planned Behaviour (TPB) and its deviations (Ajzen and Fishbein 1980; Ajzen 1991) explained that the behavioural outcome is identified by analytical skills rather than habits. Since that time, researchers have revealed contradictions or additional facets in human behaviour which could not be justified by traditional models (Kanev and Terziev 2017; Parkinson, Russell-Bennett, and Previte 2018). Therefore, emerging behavioural theories attempt to explain the

limitations of self-control. In this vein, Uses and Gratifications Theory defines a lack of self-control as an inability to neglect smaller immediate rewards in favour of the larger delayed ones (Katz, Blumler, and Gurevitch 1973; Mischel 1974). Another strength model of self-control (Baumeister et al. 2007) compares self-control with a muscle which has limited resources which can exhaust and block capacities to adjust own behaviour for some time. In parallel with this approach, dual-processing or dual-system theories interpret self-control as a struggle between impulsive and intentional processes (Evans 2008; Strack and Deutsch 2004).

However, Fujita (2011) suggests that self-control is broader than the efforts to inhibit impulses. The researcher advocates for the dual-motive conceptualisation when individuals with a higher level of self-control prioritise their distal motivations over the proximal ones. In contrast, Berkman et al. (2017) insist on the rationality of behaviour and interpret self-control as a value-based choice. Finally, Fujita (2011) suggests that self-control is not necessarily the best pattern of behaviour in case an individual pursues a wrong goal which adversely impacts on well-being. Then, self-control outcomes depend on personal abilities to identify and prioritise life values.

3.2.3 Self-control in the Social Media Context

This multi-perspective range of self-control theories makes it a challenging task for academics to define a single applicable framework for the social media context which is evolving fast (Wearesocial.com 2019). For this, researchers either attempt to apply acknowledged behavioural theories (Baker and White 2010; Pelling and White 2009; Polites, Serrano, Thatcher, and Matthews 2018; Whelan et al. 2020) or adapt theoretical findings for other media to social media use (Assunção and Matos 2017; Du et al. 2019).

Chapter Three. Study One: Systematic Literature Review

In this vein, a lack of agreement on self-control frameworks for the social media context is predictable.

To conduct this review on self-control, it is important to outline key terms for the literature search. In their study on social media, Błachnio and Przepiorka (2016) advocate for differentiating the terms self-control and self-regulation. They claim that self-regulation relates to the proactive managing of behaviours to achieve long-term goals while self-control is an individual capacity to inhibit impulsive temptations for instant gratifications in favour of life priorities.

Meanwhile, due to the lack of self-control studies on social media, researchers often refer to the latest findings on the Internet and other media use. For example, in their study on unregulated Internet use, LaRose et al. (2003) claim that poor self-regulation is based on diminished self-control and link deficient self-regulation to impulsive and habitual behavioural outcomes. Another paper on social media use (Whelan et al. 2020) draws on a similar approach and uses the self-regulation term when describing the strength model of self-control. In other studies on Facebook, researchers (Firat 2017; Iranmanesh, Foroughi, Nikbin, and Hyun 2019) describe a self-control failure as a fiasco in making decisions consistent with personal major life goals. A similar interpretation is used in other studies on social media but in relation to self-regulation (Foroughi, Iranmanesh, Nikbin, and Hyun 2019; Lee, Ho, and Lwin 2017). Finally, investigators (Gao et al. 2019; Leng et al. 2019; Turel and Qahri-Saremi 2016) discuss impulsive reactions to social media stimuli and do not include the terms self-control and self-regulation but rather inhibitory control, cognitive-behavioural control or psychological craving.

To address this inconsistency in definitions, this study considers the parallel use of at least two key terms of self-control and self-regulation in the current literature and include

both of them in the search. By doing this, it can never be claimed that theoretical constructs are the same. This approach aims to find out what is known about users' ability to control their behaviour on social media from different perspectives. However, for clarity, this study draws on using a term of self-control for this literature review. This review follows a broad definition of Hofmann et al. (2012) who describe self-control as individual motivation and capacity to inhibit a desire or temptation which contrasts with long-term self-regulatory goals.

3.3 Methods

In contrast to narrative reviews, systematic literature reviews have a structured and comprehensive approach (Bearman et al. 2012). This type of review is defined as a well-organised synthesis of accessible evidence which answers the research question. Being a complex specific and structured process, systematic literature reviews could be expected to be highly impersonal. However, the results of this kind of review depend on the chosen strategy, techniques and judgements of researchers as well (Gough 2007). It becomes an even greater responsibility for scholars to consider the rapid ongoing development of social media. The infant stage of this research and the constant progress of technologies make it challenging for academics to track all recent findings and conceptualisations. These could be possible reasons for a lack of systematic literature review on self-control theories with regard to social media. Another reason could be a lack of agreement on terms and the definition of self-control for the social media context. For this reason, a systematic literature review is conducted to reveal what self-control frameworks are applied to social media use currently.

For the search of studies, the PRISMA identification process is followed (Moher et al. 2009). This approach is widely used in the exploration of various excessive behaviours

Chapter Three. Study One: Systematic Literature Review

including problematic screen media use (Anderson et al. 2017; Frost and Rickwood 2017; Johnson, Horton, Mulcahy, and Foth 2017; Kubacki, Rundle-Thiele, Pang, and Buyucek 2015; Vondráčková and Gabrhelik 2016). The search of papers for this study was conducted via seven databases, namely EBSCO, ACM digital library, IEEE Xplore, Scopus, Science Direct, PsychInfo and Sage journals online. The databases were selected from the database of the University of Canterbury (canterbury.ac.nz 2020) and the subjects of Business, Humanities, Social Science; Computer Science and Software Engineering; Psychology; Multidisciplinary and others. Databases were searched using the following terms: "self-control", "self-management", "self-regulation", "social media", "social network sites", "SNS", "Facebook", and "Instagram". Considering a shortage of highly relevant papers, more records were identified on Google Scholar manually. The following search criteria were adopted for this stage of identification: (1) peer-reviewed academic papers; (2) between 2000 and 2020; and (3) written in English. Details on selected databases, included collections, number of records and search terms are shown in Appendix 2.

Using the described criteria, 2032 papers were included in total (Figure 3.3.1). Titles, abstracts and keywords of all records were screened for duplication and general eligibility criteria on the relevance of the topic. Papers were considered as not eligible if social media and self-control were not the main subject of a study, research was purely empirical, a study focused primarily on medicine or psychological disorders, studies were not published in journals. Papers were selected in case they were clearly focused on social media as web-based online communities with advanced functionality of creating and sharing online content. Also, papers were selected when focused one of the concrete social media platforms such as Facebook, and they were related to theories and concepts of self-control or self-regulation. In this way, 88 texts were selected for further analysis.

At the next stage, 54 full-text papers were excluded which either did not focus primarily on social media or did not discuss or conceptualise self-control or focused on other research areas. Papers about impulsive social media use were not excluded in case they interpreted attempts to restrain this type of behaviour on social media. As a result, 24 records are included in the final analysis and exploration.

Figure 3.3.1 The PRISMA Flow Diagram of the Literature Selection Process



Note: adapted from Moher et al. (2009, p. 1009).

Table 3.3.1 outlines the pathway for the current systematic literature review by describing the nine main stages of this process. For this, the current study draws on Gough's (2007) nine-phase process. It makes it possible for other researchers to be involved in all stages of the process aside from learning its findings.

Table 3.3.1 Nine Phases of the Systematic Literature Review

Phase	Description	The current study
1	Establishing a specific review question	The review of current conceptualisations of self-control in the social media context.
2	Defining inclusion and exclusion criteria	Main search criteria: (1) peer-reviewed academic papers; (2) between 2000 and 2020; (3) written in English. Papers on medical interventions were excluded.
3	Defining search strategy including information sources	Databases included: EBSCO, ACM digital library, IEEE Xplore, Scopus, Science Direct, PsychInfo, Sage journals online, Google Scholar (manually). Keywords used: "self-control", "self-management", "self-regulation", "social media", "social network sites", "SNS", "Facebook", and "Instagram".
4	Screening studies	The initial search identified 2032 records. Based on PRISMA technique (Moher et al. 2009), 1944 non-qualified or duplicate records were excluded. This resulted in 88 papers for the final stage of screening papers. Going further, the papers were removed if they did not focus primarily on social media; did not discuss conceptualisation of self-control; included insufficient explanation or focused on learning. The final number of records was 25. The mapping of the screening process is shown in Figure 3.3.1.
5	Reporting or mapping results of the search	
6	Data extraction from studies	Data extraction was conducted in two following directions: (1) applied theoretical frameworks with main findings; (2) research design and research samples. Both directions are shown in relevant tables (Appendix 1 and Table 3.4.2 correspondingly).
7	Evaluation of methodological data quality and relevance	After data extraction, all papers were screened in terms of their relevance to the main research question of this review. Then, the data in selected records were evaluated against the EPHPP Quality Assessment Tool (Thomas et al. 2004) as shown in Appendix 3. The evaluation of data quality resulted in a weak rating for one of the selected records. However, it was considered to keep it for this review together with all other initially selected papers.
8	Synthesis of evidence	Extracted data were synthesised in chronological order which is highly relevant for the rapidly growing social media use distribution.
9	Discussion and conclusion	The review outlines avenues for future research and results in recommendations for research design and sampling. In parallel, this review provides possible reasoning for failures of recent self-control interventions.

Note: adapted from Gough (2007, p. 219) and Bearman et al. (2012, p. 627)

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Phase 7 in Table 3.3.1 includes the evaluation of data quality which was conducted by using the Effective Public Health Practice Project (EPHPP) quality assessment tool (Thomas et al. 2004). According to Armijo-Olivo et al. (2012), the EPHPP is focused rather on the assessment of data quality compared to the assessment of a higher risk of bias via the Cochrane Collaboration Risk of Bias Tool (CCRB). The EPHPP tool is considered to be more relevant for the current study due to two main reasons. First, the main research question of the current review relates to the conceptualisation of self-control rather than findings from interventions. In this way, this review is focused on the quality of conceptual inferences rather than the preciseness of experimental findings. The second reason is that selected records include studies with both surveys and experiments in the research design which means that measuring bias is not always possible in the same way for all the papers. Therefore, this study employs the EPHPP assessment to evaluate the quality of diverse research findings.

As reported in Appendix 3, the data quality evaluation identified sixteen records having a strong rating, seven were rated as moderate while one rated as weak. Those studies which rated moderate and weak showed poor performance in either selection bias and withdrawals, or blinding. Expectedly, some studies could not provide perfect blinding as questions of many surveys and scales are self-explanatory. In the meantime, a weakly rated study (Pelling and White 2009) suffered from a skewed sample towards women and reporting less than 60% of participants who agreed to participate after being invited. In this case, it is possible to consider the 2009th year of this study when a common social media profile of a user was not identified yet and keep this study in the review.

3.4 Results and Discussion

3.4.1 Conceptualising Self-control in the Social Media Context

The rapid expansion of social media makes it appropriate to analyse the application of theoretical frameworks for the social media context in chronological order (see Appendix 1). This shows how the conceptualisation of self-control on social media transforms in parallel with the growth of social media itself.

In this manner, early studies on social media use and self-control draw mostly on the TPB. Researchers justify problematic social media use through attitudes, subjective norms and perceived behavioural control. To define additional antecedents of the problematic use, the TPB framework is further extended with personality characteristics (Baker and White 2010). This exploration coincides with the speedy distribution of smartphones and mobile data consumption (Wearesocial.com 2019). Presumably, personal 24/7 access to social media raises more research questions on how personal traits boost social media use. Therefore, researchers started exploring excessive social media use through the lenses of the uses and gratification and identity theories (Abrams and Hogg 1990; Davis, Bagozzi, and Warshaw 1992; Katz et al. 1973; Stryker 1968). These investigations (Omar and Subramanian 2013) provide indisputable evidence of lost relationships between the ability of users to control their behaviour and social media addiction. Therefore, starting from 2013, the motivational and identity perspective of self-control on social media is studied in parallel with the capacity-based one. In this way, the strength model of self-control (Baumeister et al. 2007) and the self-regulation framework (Bagozzi 1992) explain the gradual depletion of self-control for social media users (Panek 2014). Finally, recent studies switch to social cognitive and dual-system theories (Caplan 2010; Davis 2001; Evans 2008; Strack and Deutsch 2004) and explore

impulsive and non-conscious behavioural responses on social media as a reason for problematic use. Academics (Turel and Qahri-Saremi 2016; Van Koningsbruggen, Hartmann, Eden, and Veling 2017) conceptualise a contradiction between users' intentions to increase their well-being and actual problematic behaviour. Consequently, this review makes it possible to divide all theoretical frameworks from selected studies into the following key groups: (1) theories of planned behaviour; (2) motivation and identity theories; (3) self-control theories; and (4) frameworks of non-planned behaviour (as shown in Appendix 1).

In general, this literature review shows a lack of agreement on the conceptualisation of self-control for the social media context. The first reason to suggest this is an inconsistency in using terms and definitions with regard to self-control. Though some researchers (Błachnio and Przepiorka 2016) suggest a distinct difference between self-control and self-regulation terms, the majority of studies use either overlapping or unrelated constructs for internal control, deficient self-regulation, cognitive-behavioural control or self-control failure which may result in confusing and contradictory outcomes in literature reviews. Secondly, the prevailing number of studies includes more than one theoretical framework to explore the ambivalence of users' feelings towards social media and their actual behaviour. This approach is reasonable considering the ongoing transformation of social media when researchers need to analyse the consequences of excessive use on the go. The third reason to claim an urgent need for a further conceptualisation is that none of the existing theoretical frameworks justifies the mechanism of self-control on social media completely. In this regard, this study supports the recent conclusions (Cudo et al. 2019; Du et al. 2019) that self-control on social media is a multi-dimensional construct rather than a unidimensional model and needs to be investigated from different known perspectives.

However, though self-control concepts are constantly modified, this review suggests several common findings from the selected papers. The first similarity relates to the overall interpretation of self-control. Though early followers of the TPB theory tend to rely on users' abilities in the area of intentional control of social media use, the prevailing number of researchers describe self-control as an imbalance between temptations to satisfy immediate desires and pursuit of valuable goals and life priorities.

Second, Appendix 1 shows that 22 out of 24 papers reveal a contradiction between conscious intentions or attitudes of users and their real-life behaviour. Surprisingly, even studies within the TPB framework reveal similar inconsistencies which do not allow justification of the link between the behavioural control of users with their intention and actual social media use (Pelling and White 2009). In the same way, contrary to their expectations, Ho et al. (2017) reveal that the self-reported attitude of social media users is not associated with excessive social media use. This kind of evidence raises questions about the impact of conscious beliefs on intentions and final behaviour on social media.

The third similar trend for many of the latest papers (Cudo et al. 2019; Gao et al. 2019; Leng et al. 2019; Whelan et al. 2020) relates to the impulsivity which is described as one of the inevitable dimensions of self-control constructs for the social media context. In this way, the individual struggle between impulsive reactions and conscious intentions justifies the application of dual-system theories for the social media context. Self-control failures are conceptualised as non-conscious impulsive responses to social media cues which outline more directions for self-control interventions. Consequently, researchers claim that social media cues become antecedents of self-control deficiencies and suggest the need to limit social media stimuli or disconnect from social media completely.

Fourthly, 5 out of 24 studies (Assunção and Matos 2017; Foroughi et al. 2019; Iranmanesh et al. 2019; Turel and Qahri-Saremi 2016; Whelan et al. 2020) propose a moderating or a mediating role of self-control or self-regulation in the relationship between antecedents and problematic social media use. If these findings are replicable on a wider scale, it gives hope that the impact of self-control may be potentially helpful for excessive social media users.

Finally, all studies link self-control failures on social media with harmful consequences for personal well-being. In this regard, investigators pay more and more attention to individual differences in traits and capacities for self-control for further interventions rather than looking for a universal approach.

3.4.2 Samples and Research Design

With regard to samples, the number of participants in selected studies varies from 43 in an experimental study (Gao et al. 2019) to 5920 for a survey (Ho et al. 2017) (as shown in Table 3.4.2). To calculate the average number of participants, studies with a very high number of participants such as 4920 and 5920 (Ho et al. 2017; Lee et al. 2017) are excluded. Then, the average number for the rest of the 22 papers is 321 respondents.

Table 3.4.2 Measuring and Sampling Techniques

Author(s)/Year	Research method	Measure(s) of self-control	Social media platform(s)	Sample size (% female, average age in years)	Country
Pelling & White (2009)	Quantitative: survey	PBC scale, 2 items (Ajzen 1991)	All	233 undergraduates (63.9%, 19.22)	n.a.
Baker & White (2010)	Quantitative: survey	PBC scale, 4 items	All	160 secondary school students (64%, 14.36)	Australia
Omar & Subramanian (2013)	Quantitative: survey	Internal Control, 3 items; Powerful Others Control, 4 items (Kim and Haridakis 2009)	Facebook	400 undergraduates (n.a.)	Malaysia
Wilcox & Stephen (2013)	Quantitative: experiments	(1) The food choice; (2) Persistence with the unsolvable task; (3) Body mass index, binge eating, credit card debt and credit score	Facebook	(1) 84 users (58%, 34.67) (2) 88 undergraduates (56%, 19.52) (3) 541 users (61%, 32.06)	US
Panek (2014)	Quantitative: survey	13- item Brief Self-control Scale (Tangney, Baumeister, and Boone 2004)	All	458 college students (74% female, M age = 18.8)	US
Błachnio & Przepiorka (2016)	Quantitative: survey	Brief Self-control Scale, 13 items; Self-regulation Scale, 10 items (Błachnio and Przepiorka 2016); Action Control Scale, 36 items (Beckmann and Kazén 1994)	Facebook	284 users (83%, 22.39)	n.a.
Meier et al. (2016a)	Quantitative: survey	Brief Self-control Scale, 8 items; Self-Report Habit Index, 4 items (Verplanken and Orbell 2003);	Facebook	354 students (71.2%, 22.89)	Germany
Turel (2016)	Quantitative: survey	Cognitive-behavioural Control, 9 items (Collins and Lapp 1992)	Facebook	341 users (52%, 23)	US
Assunção & Mato (2017)	Quantitative: survey	Generalized Problematic Internet Use Scale 2 (Caplan 2010); Online Cognition Scale (Davis, Flett, and Besser 2002)	Facebook	761 users (46.7%, 15.8)	Portugal
Firat (2017)	Mixed-method design	Brief Self-control Scale, 13 items	Facebook	60 students (36.7%, aged 20-26)	Turkey
Ho et al. (2017)	Quantitative: survey	PBC, 4 items	All	4920 adolescents (50.6%, 14.41) and 1000 adults (52%, aged 19-50)	Singapore

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Lee et al. (2017)	Quantitative: survey	Deficient Self-regulation, 3 items; Social Media Habit Strength, 3 items (LaRose et al. 2003)	All	4920 users (50.6%, 14.41)	Singapore
Van Koningsbruggen et al. (2017)	Quantitative: experiment	Affect Misattribution Procedure (Payne, Cheng, Govorun, and Stewart 2005); Facebook Cravings, 6 items (Tiffany and Drobos 1991)	Facebook	1) 72 MTurk workers (59.7%, 34.56) 2) 128 MTurk workers (63.3%, 35.31)	US
Cao et al. (2018)	Quantitative: survey	Cognitive-behavioural Control, 6 items (Turel and Qahri-Saremi 2016)	All mobile	505 mobile social media users (52.1%, less than 30 y.o.)	China
Du et al. (2018)	Quantitative: survey	Brief Social Media Self-control Failure, 3 items; Deficient Self-regulation Scale, 7 items (LaRose and Eastin 2004); Brief Self-control Scale, 13 items	All (Facebook - 94%)	405 users (51.3%, 31.12)	US, UK, Canada, and Australia
Osatuyi & Turel (2018)	Quantitative: survey	Social Self-regulation scale, 6 items (Young and Oei 1996); Habit Scale, 3 items (Turel 2015)	Facebook	161 users (42.9%, 49% of 21-30 y.o.)	US
Polites et al. (2018)	Quantitative: survey	Deficient Self-regulation of Time Scale, 4 items (Macan 1994)	Facebook	214 students (50.9%, 77% of 21-24 y.o.)	US
Cudo et al. (2019)	Quantitative: survey	Brief Self-Control Scale, 13 items; Action Control Scale, 36 items (Kuhl 1994)	Facebook	234 users (91.5%, 24.86)	Poland
Du et al. (2019)	Quantitative: survey	Self-Report Habit Index, 12 items; Social Media Self-control Failure, 3 items (Du et al. 2018)	All (Facebook – 86%)	590 users (74%; 33.81)	United Kingdom (86%)
Foroughi et al. (2019)	Quantitative: survey	Self-regulation Scale, 7 items (Diehl, Semegon, and Schwarzer 2006)	Facebook	358 users (56%, 33.3)	n.a.
Gao et al. (2019)	Quantitative: experiment	The Go/No-Go Task (Lapierre, Braun, and Hodgins 1995)	All	43 users (48.8%, 19-20 +-1.0 years)	China
Iranmanesh et al. (2019)	Quantitative: survey	Self-control Scale, 24 items (Grasmick, Tittle, Bursik Jr, and Arneklev 1993)	Facebook	348 users (57.8%, 32.5 years)	Malaysia
Leng et al. (2019)	Mixed method: interviews and experiment	Cue Reactivity Paradigm Task (Sayette et al. 2000)	All	60 undergraduates (50%, 23.9)	China
Whelan et al. (2020)	Mixed design method: interviews and survey	Deficient Self-regulation, 7 items (LaRose et al. 2003)	All	182 students (52%, 23 years)	Ireland (42%), US (32%), Finland (26%)

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Meanwhile, 13 out of 24 studies claim the recruitment of students for their studies. This demonstrates that researchers tend to explore social media use not of adolescents and young adults only but of various age groups. It is a highly relevant approach when considering the audience profile of social media platforms such as Facebook and Instagram with the biggest age group of 25-34 years old (Wearesocial.com 2019).

Almost all studies tend to recruit approximately the same number of men and women with a few exceptions which notably favour women (Błachnio and Przepiorka 2016; Cudo et al. 2019; Du et al. 2019; Meier et al. 2016a; Panek 2014). Meanwhile, the latest statistics show the predominance of men on Facebook, LinkedIn and Twitter (Wearesocial.com 2019). This discrepancy may be neglected for this review; however, it is relevant to consider it for future studies.

In terms of location, papers in this review do not focus primarily on one country or region. This shows the high relevance of self-control concerns for various territories and secures this review from prejudices connected with cultural differences and backgrounds.

Regarding the research design, in most selected papers, investigators conduct quantitative studies, particularly surveys which provide distinct and measurable findings for the conceptualisation. However, these may eventually end in conceptual confusion without sufficient exploratory input from qualitative studies. Beyond that, it is relevant to highlight that surveys may not be sufficient for quantitative studies as well. Frost and Rickwood (2017) insist that to explore impulsive behavioural reactions, researchers can hardly rely on self-reported measures only. Meanwhile, several of the latest studies (Gao et al. 2019; Leng et al. 2019; Wilcox and Stephen 2013) conduct either experiments on impulsivity or include implicit measures to conceptualise the impulsive mechanism of social media use. Another finding demonstrates that there is a lack of consistency in

measuring self-control on social media. Depending on the nature of the study, academics use either existing self-control scales on addictive behaviours without any modifications or adapt acknowledged scales for the social media context. Considering this, the current study suggests that the lack of conceptualisation in this research topic goes in parallel with desynchronised and insufficient measurement tools on self-control which may eventually result in disconnected and contradictory findings.

3.5 Conclusion

From what is known, this is the first systematic literature review on the conceptualisation of self-control in the social media context. While existing outcomes highlight the importance of self-control on managing problematic social media use, many questions on the appropriate theoretical grounding for self-control interventions remain unanswered.

In general, this review demonstrates the lack of agreement on the theoretical framework of self-control on social media. The variety of concepts and outputs from selected studies show that the self-control question becomes a challenging issue not only for users but for researchers as well. However, the analysis of selected papers demonstrates that acknowledged theoretical constructs can hardly be straightforwardly applied to the social media context without any alterations. Therefore, investigators either attempt to extend acknowledged frameworks or design and test new theories.

The chronological order of selected studies shows the gradual switch of research from the theories of planned behaviour to theoretical constructs which justify the contradiction between conscious intentions and real-life impulsive behaviour. In this regard, the prevailing number of studies is common in their interpretation of self-control failures as an imbalance between immediate temptations and valuable goals or as a conflict between several selves in one personality. Recently, scholars have focused on the impact of

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personal characteristics and the application of dual-system theories in the investigation of problematic social media use. This tendency raises an important question about the reliability of using only self-reported measurement tools to explore impulsive and habitual behavioural responses. Altogether, the conclusions of the current review support other researchers (Cudo et al. 2019; Du et al. 2019) in their claim that self-control on social media is a multi-dimensional construct. Therefore, it is crucial to summarise and consider all previous findings to bring more clarity to the design of further investigations and self-control interventions.

3.6 Chapter Summary

Chapter Three suggests the discussion on the background, the method and findings of Study One. In this study, a systematic literature review is conducted to analyse the current literature on the conceptualisation of self-control on social media. For this, the relevant literature is identified in peer-reviewed journals between 2000 and 2020. As a result, 24 papers from seven academic databases were analysed in chronological order. In general, this review showed the lack of agreement on terms, theoretical frameworks and methodologies to interpret the self-control mechanism on social media. The sequence of applied frameworks demonstrated a gradual switch from theories of planned behaviour to theories focusing on self-control failures as a result of non-planned behaviour. This explains the focus of recent studies on the impulsivity of excessive social media users and the application of dual-system theories. However, research design included mainly self-report tools to investigate impulsive self-control failures which may result in misleading findings and deficient theoretical grounding for self-control interventions. All selected papers claimed a negative impact of social media self-control failures on personal well-being.

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These outcomes extended the findings of the literature review in Chapter Two of the current thesis. In this way, this chapter provided additional justification for drawing on dual-system theories to investigate the impact of self-control on excessive social media use. Beyond that, Study One provided the more robust theoretical grounding for the conceptual framework of Study Two.

Chapter 4. Study Two: Conceptual Framework and Hypotheses

4.1 Introduction

This chapter introduces a conceptual model of the current research. This model describes my suggestions on the antecedents and consequences of excessive social media use; and a possible impact of self-control on it. Altogether, the variables within the research model constitute the underlying mechanism of excessive social media use and provide a theoretical grounding for further interventions. Considering the nature and the flow of this study, the description of all the hypotheses is followed by introducing a research model.

4.2 Research Hypotheses

To address Objective Two and RQ1, RQ2, RQ4 of this study, eight research hypotheses are introduced. Hypothesis One explores the relationship between Implicit Attitude and Impulsive Social Media Use. Hypothesis Two is based on the association between Impulsive and Excessive Social Media Use. Both Hypotheses One and Two address RQ2. Hypotheses Three and Four investigate the relationship between Impulsive and Excessive Social Media Use and Poor Well-being. In this way, RQ1 is addressed. Finally, the four last hypotheses on Self-control aim to provide an answer to RQ4. Hypotheses Four and Five are based on the relationship between Self-control and Impulsive and Excessive Social Media Use correspondingly. Lastly, Hypotheses Seven and Eight explore the moderating role of Self-control in the relationship between Implicit Attitude and Impulsive Social Media Use; and between Impulsive and Excessive Social Media Use correspondingly.

4.2.1 Hypothesis One

Recent studies on excessive Internet and social media use (Billieux and Van der Linden 2012; Sagioglou and Greitemeyer 2014) reveal an inconsistency between users' conscious attitudes and their actual impulsive behaviour. Researchers call this a "forecasting error" and assume that implicit measurements of attitudes reveal users' true motivations. A few studies provide similar evidence of this phenomenon, for example, the impact of implicit attitudes on the consumption of ethical products (Govind et al. 2019), green vegetables (Mattavelli, Avishai, Perugini, Richetin, and Sheeran 2017) and alcohol (Lindgren, Neighbors, Westgate, and Salemink 2014). In parallel, a model of dual attitudes interprets implicit attitude as personal evaluations of "the unknown origins" which are activated automatically and influence implicit, or uncontrolled, behavioural responses (Wilson et al. 2000, p. 104). Researchers link the implicit attitude to an impulsive system that functions automatically and often overrides deliberate behaviour. Therefore, this study explores the same relationship for the social media context.

H1: An Implicit Attitude towards social media is positively associated with Impulsive Social Media Use.

4.2.2 Hypothesis Two

With regard to social media, its excessive use is regularly linked to impulsivity (Anderson et al. 2017; Billieux and Van der Linden 2012; Delaney et al. 2018; Turel and Bechara 2016). Impulsive automatic behavioural responses to social media stimuli result in using social media on the spur of the moment and this prejudices other daily activities or the safety of self or others (Turel and Qahri-Saremi 2017). In the meantime, recent studies on Internet use (Vargas et al. 2019) show no significant relationships between impulse control deficits and problematic Internet use. This research aims to explore this kind of relationship for excessive social media use and, hence, suggests that:

H2: Impulsive Social Media Use is positively associated with Excessive Social Media Use.

4.2.3 Hypothesis Three

Excessive screen and social media use are commonly defined as an impulse-control disorder (Billieux and Van der Linden 2012; Guedes et al. 2016; Ioannidis et al. 2016; Liu and Potenza 2010) which has been linked to the problematic behaviour and deterioration of well-being (Kuss and Griffiths 2017). Moreover, the unplanned impulsive behaviour on social media results in a number of varying negative effects for users' well-being including risk to their lives (Turel and Qahri-Saremi 2017). In this connection, it is claimed that:

H3: Impulsive Social Media Use is positively associated with Poor Well-being.

4.2.4 Hypothesis Four

Despite the possible communication value social media can provide, excessively using it is often associated with a decline in personal well-being (Bányai et al. 2017; Caplan and High 2006; Krasnova et al. 2013; Kross et al. 2013; Meshi et al. 2019; Sriwilai and Charoensukmongkol 2016). Sampasa-Kanyinga and Lewis (2015) warn that daily social media use of more than two hours per day, which is already typical for the average user (GlobalWebIndex 2019; Salim 2019), is positively associated with psychological distress and a need for mental health support. Hence, this study hypothesises the following:

H4: Excessive Social Media Use is positively associated with Poor Well-being.

4.2.5 Hypothesis Five

Recent reviews suggest that a lower level of self-control correlates with higher impulsivity for screen media and social media use (Anderson et al. 2017; Du et al. 2019). Similarly, Facebook users who have more self-discipline have more capabilities to resist the impulse to use social media (Błachnio and Przepiorka 2016). In their morphological study on problematic Facebook use, Turel et al. (2014) compare Facebook addiction with other addictive behaviours. They report that the inhibitory (reflective) brain system is overridden by the impulsive one for problematic users which explains their loss of control. Based on the findings listed above, this research suggests that:

H5: Self-control is negatively associated with Impulsive Social Media Use.

4.2.6 Hypothesis Six

In parallel, researchers (Billieux and Van der Linden 2012; Blinka et al. 2015) claim that problematic screen media use is connected with an inability to control ones' own behaviour. In the same way, Wilcox and Stephen (2013) justify the same claim with regard to Facebook users. They provide evidence for the association of poor self-control with a high level of Facebook use which harms users' well-being and social order. Adding to this, Turel and Quahri-Saremi (2016) extend the interpretation of self-control by drawing on dual-system theories. They demonstrate that cognitive-behavioural control, which represents the reflective brain system, is negatively associated with problematic Facebook use. This study aims to test a similar relationship for social media use in general by testing the following hypothesis:

H6: Self-control is negatively associated with Excessive Social Media Use.

4.2.7 Hypothesis Seven

Prior studies have confirmed the moderating role of self-control on various types of excessive or unhealthy behaviour. For example, self-control moderates the impact of mass media on the level of alcohol and tobacco use (Wills et al. 2010). In their study on adolescents, Gardner et al. (2008) claim that self-control moderates the relationship between deviant peer affiliations and antisocial behaviour, while Wills et al. (2008) provide evidence that self-control reduces the impact of negative happenings on substance use. They call it a “buffering effect” of self-control and reflect on its importance. In the same manner, this work aims to investigate the moderating role of self-control for social media use:

H7: Implicit Attitude towards social media is positively associated with Impulsive Social Media Use only if the level of Self-control is low.

4.2.8 Hypothesis Eight

In their study on problematic Facebook use, Turel and Qahri-Saremi (2016) draw on dual-system theories and adapt the excessive drinking measurement inventory by Collins and Lapp (1992) for Facebook use. For this, researchers relate impulsive use to cognitive-emotional preoccupation while reflective use is assigned to cognitive-behavioural control. Based on this, Turel and Qahri-Saremi (2016) show the moderating role of cognitive-behavioural control for the relationships between cognitive-emotional preoccupation and problematic social media use. This research intends to test the similar moderating role of self-control for the relationships between the impulsive system and problematic behaviour. Therefore, it is hypothesised that:

H8: Impulsive Social Media Use is positively associated with Excessive Social Media Use only if the level of Self-control is low.

Table 4.2.1 shows a summary of all the hypotheses with all independent and dependent variables involved and links them to appropriate research questions.

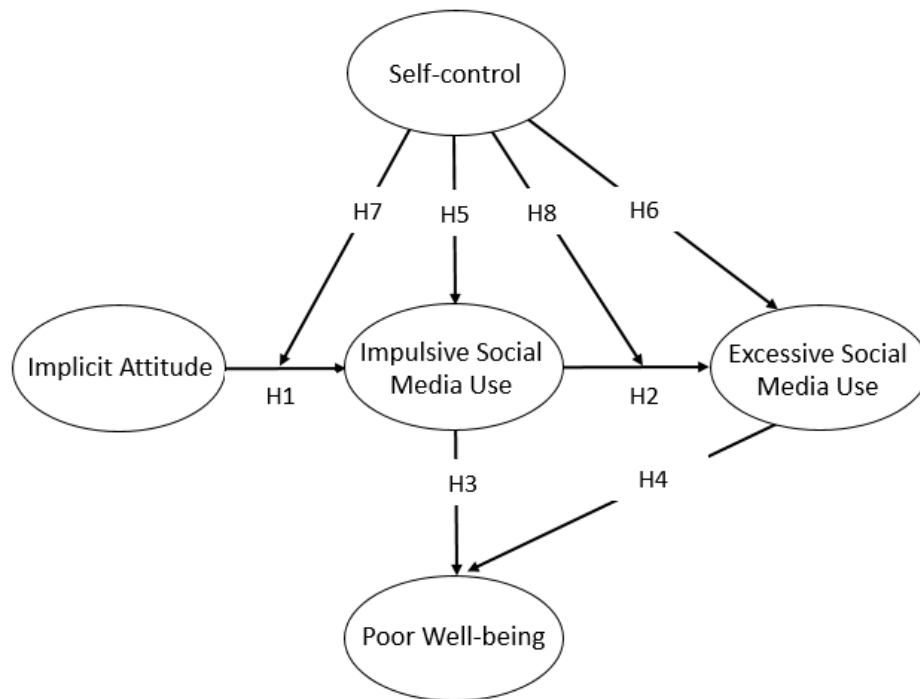
Table 4.2.1 Summary of Hypotheses

Hypothesis	Independent Variable	Dependent Variable	Moderating Variable	RQ
H1	Implicit Attitude Towards Social Media	Impulsive Social Media Use		RQ2
H2	Impulsive Social Media Use	Excessive Social Media Use		RQ1
H3	Impulsive Social Media Use	Poor Well-being		RQ1
H4	Excessive Social Media Use	Poor Well-being		RQ1
H5	Self-control	Impulsive Social Media Use		RQ4
H6	Self-control	Excessive Social Media Use		RQ4
H7	Implicit Attitude Towards Social Media	Impulsive Social Media Use	Self-control	RQ2, RQ4
H8	Impulsive Social Media Use	Excessive Social Media Use	Self-control	RQ1, RQ4

4.3 Proposed Conceptual Framework

In summary of all described hypotheses, this research suggests that the role of social media in diminishing well-being is processual and comprised of multiple factors. The research model for this thesis (as shown in Figure 4.3.1) is formulated by drawing on dual-systems and self-control theories discussed in Chapters Two and Three. The model shows the relationships between the main constructs and aims to test the potential impact of self-control on excessive social media use.

Figure 4.3.1 Research Model



The model of the current investigation is tested by using a cross-sectional study which is described in detail in Chapters Five and Six. Meanwhile, this study suggests that all eight hypotheses of this study are processual rather than definitional. By saying this, this work follows McDermott et al. (2008) in their claim that processual research results in an explanation of the conceptual framework and actionable knowledge. This knowledge can be used to explore a planned change rather than prompting immediate action. In contrast to action research, processual research develops a guideline for action where investigators are observers and ideologists rather than agents of immediate actions. At the same time, Hinings (1997) highlights that processual research is practitioner friendly and only benefits from using multiple methods. The researcher explains that though processual research is used in qualitative studies in most cases, it is beneficial for academics to employ this approach for quantitative studies as well. However, he warns about issues connected with the common method variance. These types of issues are addressed in the following chapter.

4.4 Chapter Summary

Chapter Four described the eight hypotheses of the current study and introduced the conceptual framework. The research model of this thesis demonstrated a suggestion to interpret the underlying excessive social media use by drawing on dual-system and self-control theories. This chapter highlighted that the role of social media in this model is processual and, consequently, the hypotheses are processual and not definitional which is appropriate for the innovative TCR framework. The following chapter provides a description of a methodological approach and research design for testing the hypotheses of this study.

Chapter 5. Study Two: Methodology

“This was a very original style of research survey that included a lot of tasks that I have never seen before”, “I would do it again”.

– Participants in this study

5.1 Introduction

Chapter Five introduces the research methodology to test the hypothesised relationships which are described in Chapter Four. The introduction of this chapter is followed by a description of the epistemological approach. Then, study design is introduced. First, this chapter justifies the sequence of measures which is important to minimise possible biases in the findings of the research. After this, further details are provided on both implicit and explicit measurements used for this exploration. The development of stimuli for the SC-IAT and the items of the self-report questionnaire are also discussed. Additionally, this chapter explains the relevance of using filler tasks to secure results from the common method bias. The description of the research design is finalised by listing the control variables used. Then, the section on research design is followed by a brief description of the testing procedure with further details on the sample and amendments made. After this, it is important to explain the recruitment process. This research claims that it is critical to consider recent reveals about the studies with the cases of data contamination on a widely used MTurk recruitment platform. Finally, the ethics approval process for the current study is outlined.

5.2 Research Design

A cross-sectional online study was used to test the hypotheses presented and validate the research model. The research was conducted using the Qualtrics online platform.

5.2.1 Sequence of Measures

Participants were qualified to take part in this study based on the results of the screening survey which is discussed below.

The survey started with the Information Sheet and the consent to participate. After that, participants were asked to answer several questions about general social media use. These items were placed at the beginning of the survey for the reason that the self-report questionnaire included questions on problematic social media use which interfered in the daily routine of participants. Their responses could make participants feel guilty because of the time they spend on social media. If asked about social media use after being asked about the impact on their well-being, respondents could intentionally underestimate their social media use level. Therefore, participants needed to answer questions about their social media use before they self-reported on possible problems connected with their excessive social media use.

Then, the main survey included both implicit and explicit measurements combined in a strictly scheduled order to avoid any possible carryover effects (Schmukle and Egloff 2005). First, participants performed interactive tasks of the Single-Category Implicit Association Test (SC-IAT). In this way, this study measured the implicit attitude towards social media which is the predictor variable of the current study. Implicit measures were followed by a self-report questionnaire. Schmukle and Egloff (2005) emphasise that implicit measures need to be presented first because they are less cognitively processed compared to explicit measures. Mattavelli et al. (2017) keep the same order by measuring the implicit attitude towards green vegetables before the explicit one. This research followed the same approach and the SC-IAT was placed before the self-report items. Then, the final section of this investigation collected self-reported data on the main variables of this study, demographic questions and control variables.

Additionally, to decrease potential common method bias, predictor variables were separated from criterion variables by incorporating filler tasks as methodological and

psychological separations (Podsakoff, MacKenzie, Lee, and Podsakoff 2003). In this manner, participants were distracted from implicit measurements before proceeding with the self-report questions. The survey ended with the sociodemographic items.

5.2.2 Single-category Implicit Association Test

To measure the implicit attitude to social media, researchers draw on the reliable Implicit Association Test (IAT) (Hofmann, Friese, and Strack 2009). Technically, the IAT is a computer-based test which evaluates individual automatic reactions to a relevant stimulus by measuring the response time of participants (Greenwald et al. 1998). The IAT is acknowledged to be a reliable technique for measuring the strength level for pairs of associations, for example, insects versus flowers. In this way, the IAT technique has been used in several consumer behaviour studies (Govind et al. 2019; Mai, Hoffmann, Lasarov, and Buhs 2017; Maison, Greenwald, and Bruin 2001).

However, sometimes there is no obvious comparator for a study target. Therefore, the Single Category Implicit Association Test (SC-IAT) was developed as a derivative of the IAT which measures the extent of associations for a single attitude object (Karpinski and Steinman 2006). Since the current research is exploring the implicit attitude to social media only, it is relevant to employ SC-IAT rather than IAT.

This thesis exploits SC-IAT which evaluates implicit attitude (e.g. pleasant and unpleasant emotions) as an association for a single category object – in this study, social media. In other words, the test aims to evaluate how strongly users associate social media (a target concept) with pleasant and unpleasant emotions (attribute dimensions) measuring the response time. In the interactive task, participants need to allocate stimuli on the screen to a target concept and one of the attribute dimensions which appears in the left and right corner of the screen. Participants are able to allocate stimuli with the “E”

and “I” keys on the keyboard. SC-IAT measures the response time with accuracy in milliseconds from the moment of showing a task on the screen up to the behavioural response. A pause of 250 ms is taken before each next stimulus is introduced. If the classification is wrong, a red cross appears on the screen and stays until the reply is corrected (Mattavelli et al. 2017) (as shown in Appendix 5). The SC-IAT scheme includes 4 blocks with practice and test sessions (Karpinski and Steinman 2006) which is adapted for this study by adding a target concept (“social media”) and attribute dimensions (“pleasant” and “unpleasant”) (as shown in Table 5.2.2).

Table 5.2.2 A Schematic Description of the SC-IAT Procedure

Block	Trials	Function	Left-key response	Right-key response
1	24	Practice	Pleasant words + social media	Unpleasant words
2	72	Test	Pleasant words + social media	Unpleasant words
3	24	Practice	Pleasant words	Unpleasant words + social media
4	72	Test	Pleasant words	Unpleasant words + social media

Note: adopted from Karpinski et al. (2006, p. 17)

The SC-IAT includes two core stages with 24 practice trials and 74 test trials each. For the first stage, pleasant words and social media stimuli are designated on the “E” key and unpleasant words are designated on the “I” key. To avoid a response bias, all stimuli are not presented at the same frequency as recommended by developers of SC-IAT (Karpinski and Steinman 2006). Stimuli are presented in a 7:7:10 ratio for social media, pleasant and unpleasant words correspondingly. It results in 58% of correct answers for the “E” key and 42% of correct answers for the “I” key. For the second stage of SC-IAT, pleasant words are designated on the “E” key and social media stimuli and unpleasant words on the “I” key. Social media stimuli, pleasant words, and unpleasant words are presented in 7:10:7 ratio. Then, 42% of correct answers are designated on the “E” key while 58% are on the “I” key.

The selection of stimuli words for attribute dimensions (“pleasant” and “unpleasant”) in this study was borrowed from the list of pleasant-meaning and unpleasant-meaning words used in the first model of the IAT method (Greenwald et al. 1998). Twenty-one stimuli words were selected for each attribute dimensions (as shown in Table 5.2.3).

Table 5.2.3 Stimuli Words for Attribute Dimensions Used in SC-IAT

	Pleasant words	Unpleasant words
1	caress	abuse
2	freedom	crash
3	health	murder
4	love	sickness
5	peace	accident
6	cheer	death
7	friend	grief
8	heaven	poison
9	loyal	stink
10	pleasure	assault
11	gentle	disaster
12	honest	pollute
13	lucky	tragedy
14	rainbow	divorce
15	gift	jail
16	honour	poverty
17	miracle	ugly
18	sunrise	kill
19	happy	rotten
20	laughter	vomit
21	paradise	agony

Note: adopted from Greenwald et al. (1998, p. 1479).

For target concept stimuli (“social media”), this study employed seven examples of social media activities to represent different functional building blocks of social media (Kietzmann et al. 2011). The selection of activities was based on functional features of Facebook with around 33% of the world population as its active users (Statista.com 2020b). For example, personal social media profile was selected for the functional block of identity, social media notification for presence, instant messengers for conversations,

a “like” button for reputation etc. Chosen activities are typical and recognisable for users of various social media platforms such as Facebook, Instagram, Twitter and others.

However, for target concept stimuli, researchers may choose to use either words or images which are associated with it. Academics (Carnevale, Fujita, Han, and Amit 2015; Meissner and Rothermund 2015) explore the difference between words and images as stimuli. They claim that images yield higher scores for the association test and they are “worth a thousand words” for IAT. They explain a simple example with a spider and suggest comparing the feelings from reading the word spider versus watching a natural image of a scaring animal. Carnevale et al. (2015) highlight that the choice of the format of stimuli for IAT and SC-IAT may influence study results and require mindful consideration.

For this research, images are used as stimuli for the target concept for three main reasons. First, social media activities are perceived and recognised visually rather than by names of activities. Second, there is no acknowledged terminology for social media functional elements. For example, a social media page with the latest content from various users, groups and communities can have different known names such as a newsfeed, a stream, an activity stream, friend updates, latest updates, an activity feed or a timeline (Quora 2018). Not using the common terms, it is more relevant to demonstrate well-known social media elements for a prompt reaction in the test rather than naming them. The final reason for using images as target stimuli is that images appear to activate stronger positive implicit associations for participants with self-control conflicts (Meissner and Rothermund 2015). To illustrate this, Carnevale et al. (2015) conduct different IAT formats for participants who follow a healthy diet. Researchers report a more negative attitude towards desserts when participants evaluated words compared to images of food.

In other words, participants tend to become more goal-oriented when reading words rather than watching images. Having words instead of images as stimuli becomes a self-intervention which has an impact on the way participants evaluate objects when having self-control conflicts. This finding results in a recommendation for public health institutions to use words rather than pictures in the food menu to increase conscious healthy eating preferences. Consequently, images were used as target stimuli for the current study to avoid any self-intervention effects and biases in the research results. For stimuli, images of recognisable social media activities are borrowed from the Facebook interface (as shown in Appendix 4).

Technically, there are different ways to conduct the SC-IAT. Though many tools are developed to conduct the IAT in person (Carpenter et al. 2017), there is a number of online solutions as well. However, in most cases, participants switch between survey platforms and another IAT application which should be installed on the desktop in advance. This technical nuance may potentially decrease the number of prospective participants. Therefore, the challenge for this research was to find a way for users not to switch between the self-report survey platform, which is Qualtrics, and another IAT application. Therefore, the iatgen open-source platform tool was used (Carpenter et al. 2017). For this, the tool was edited manually in R Studio software (rstudio.com 2019). In this way, the SC-IAT was designed in accordance with the above-described characteristics and attributes for the current study. Then, the SC-IAT code was manually incorporated in the Qualtrics survey. This approach allowed users to complete a full survey without any technical distractions. Additionally, the research was not limited with terms and conditions of licences for existing online tests such as the number of participants or the duration of access.

5.2.3 Self-Report Questionnaire

All measurements were based on existing reliable scales, with some adjusted to the context of social media use (see Appendix 7).

To measure aspects of *general social media use*, this study borrowed and adapted items from the Facebook Activity Measure (Tran 2012) (six items; e.g. “On average, how much time do you spend on social media for personal (not professional) purposes?”). Measuring *impulsive social media use* presented some difficulty in that common standards are lacking and do not capture the issue in a real-world context (Tomko et al. 2014). Researchers explain that traditional retrospective questions or laboratory tasks neglect individual dissimilarities and do not capture impulsivity as it happens in real life. To address this problem, this research combines items from two acknowledged scales, namely an adapted version of the Momentary Impulsivity Scale (Tomko et al. 2014) (three items; e.g. “I spent more time on social media than I meant to”) and items on diminished impulse control from the Online Cognition Scale, which has been adapted for addicted Internet users (Davis et al. 2002; Meerkerk 2007) (three items; e.g. “I often find it difficult to stop using social media when I am online”). This study borrowed the *excessive social media use* scale from the Excessive Internet Use scale (Blinka et al. 2015) and the Bergen Facebook Addiction Scale (Andreassen et al. 2012), adapted to the social media context (five items; e.g. “How often during the last month have you become bothered, restless or troubled when you cannot be on social media?”).

Poor well-being was measured by using two factors of interpersonal and health-related problems and time management problems, adapted from the Chen Internet Addiction Scale which is one of the most widespread instruments on excessive screen media behaviours (Aboujaoude 2010; Anderson et al. 2017; Chen, Weng, Su, Wu, and Yang

2003; Mak et al. 2014) (six items; e.g. “Although using social media has negatively affected my relationships, the amount of time I spend online has not decreased”). In terms of measuring well-being, this study supports Kahneman et al. (2006) in their claim that participants may interpret the same questions about emotions differently. To avoid varying interpretations of questions about feelings, this survey focused on diverse outcomes of unhealthy behaviour rather than the subjective evaluation of personal emotions. *Self-control* is measured as a trait via the brief Self-Control Scale (Tangney et al. 2004), using items on impulse control (four items; e.g. “I have a hard time breaking bad habits”).

Finally, *socio-demographic items* are borrowed from the New Zealand Census classifications and statistical standards (stats.govt.nz 2019) and Age NZ Standard Classification (aria.stats.govt.nz 2019) (five items; e.g. “The following questions ask a little bit about your background, to give us an indication of the demographics of the participants. Your gender: “Female”, “Male”, “Gender diverse” etc.)

5.2.4 Filler Tasks

For this research, it was important to consider effective strategies to control the main concerns connected with a cross-sectional design. Researchers (Jakobsen and Jensen 2015; Podsakoff et al. 2003; Spector 2019) claim that cross-sectional studies can suffer from common method bias and suggest separating measures temporally, psychologically, or methodologically. Podsakoff et al. (2003) highlight the particular importance of the separation of predictor variables from criterion variables when exploring attitude-attitude relationships. To reduce bias, academics recommend separating measures in a temporal, methodological or psychological way.

The current research includes both implicit and explicit attitude measurements in a strict order to avoid any possible transferring effects (Schmukle and Egloff 2005). This study measured both the main predictor, which is the implicit attitude towards social media and all dependent variables in the same survey without time lags. As soon as temporal separation was hardly possible, measures were separated methodologically and psychologically. For the methodological separation, this survey employed different measurement tools which are the SC-IAT and Likert scales. To separate variables in a psychological way and address the possibility of common method variance, this research incorporated several filler tasks between the SC-IAT and self-report questionnaire.

Filler tasks are supposed to distract participants from the previous measurement before proceeding with the next one and to prevent a so-called covert rehearsal (Bower 1972). Researchers (Jamieson and Harkins 2011) highlight that the extent of the attention which is required by a filler task is an important aspect. In a case where the filler task is simple, participants can still think about the main topic of the survey in parallel, therefore a filler task needs to demand a high level of concentration. However, filler tasks should not require special intellectual skills in order not to evoke negative emotions. For their filler tasks, investigators use different items such as generic short-answer questions (e.g. who is the current governor of a state) (Murdock Jr 1960), simple mathematical tasks (Jamieson and Harkins 2011) or listening to classical music tracks and rating them on a Likert scale (Holmes, Mathews, Dalgleish, and Mackintosh 2006).

In this study, a filler task was placed after the SC-IAT allowing participants to relax after the fast blinking of images on the screen. At the same time, filler tasks should not make them feel that their intellectual capacities are being tested. To address this, this survey borrowed four paintings by well-known artists, specifically Vincent van Gogh, Claude

Monet and Pieter Bruegel the Elder, for the filler tasks. The paintings of these artists are considered to be in the public domain (vangoghmuseum.nl 2019). The copyright term for drawings consists of the duration of their authors' life plus 100 years which is the case for used paintings (Petri 2014). The first two filler tasks asked participants to rate paintings depending on how pleasant they are for participants. The third filler task asked participants to focus on five selected areas of a painting and mark the areas they liked and did not like. The fourth filler task was on a painting with lots of visual details. Participants were asked to mark several spots on the painting that attracted most of their attention (as shown in Appendix 8). This approach to filler tasks did not require using high intellectual abilities. Furthermore, it created an impression of testing personal visual preferences and distracted attention from the previous questions.

The efficiency of this approach was evaluated by the feedback of respondents at the end of the study. Though asked about their overall experience of the survey, many of them mentioned the filler tasks in particular, e.g. "I enjoyed looking at the paintings", "I enjoyed the painting part; I used to take art in college so I knew all of them", "starry night is one of my faves" or "I really enjoy how this survey used paintings and allowed users to select what they found interesting about each image". Therefore, it is assumed that the filler tasks created a feeling of testing one more aspect of personal preferences and distracted participants to an appropriate extent to reduce possible bias.

5.2.5 Control Variables

Beyond the main variables, the current study included measuring control variables. By doing this, this investigation aimed to reveal possible additional patterns of behaviour which are introduced in the literature on social media, however not in connection with the implicit attitude and impulsive brain system.

First, several items measuring *general social media use* such as time and frequency from the Facebook Activity Measure (Tran 2012) were included. By doing this, this study aimed to test the impact of time measurements on the mechanism of excessive social media use.

Second, *socio-demographic items* were included as control variables too. Krasnova et al. (2013) include demographic characteristics as control variables in their studies on social media. For example, they claim that women tend to experience feelings of envy more often than men during social media use. By including similar items on demographics, my purpose was to test if any particular groups in society are more vulnerable to excessive social media use than others.

Finally, various *social media activities* were included as control variables for this research. Researchers (Meerkerk 2007; Pontes, Kuss, and Griffiths 2015a) suggest that excessive Internet use is connected with a focus on certain activities rather than using a wide range of them. Blinka et al. (2015) conclude that unhealthy screen media use is not always defined by time spent online but rather by being able to stick to the primary online activity and lack of self-control. In the same vein, Pontes et al. (2015b) claim that excessive Internet users are not dependent on the Internet in general but rather certain online activities such as social media, chatting on instant messengers and others. Participants in their study confirmed that they would decrease their online time and their desire to access the Internet in case their main activity is limited. These findings stress that it is important to investigate the excessive use of new technologies as separate online activities. Though it is not the primary aim of the current study, the impact of several social media activities on excessive behaviour was tested. For this, the survey drew on functional blocks of social media sites suggested by Kietzmann (2011) and participants

were asked about social media activities they have engaged with in the past month (five items, e.g. scrolling newsfeed, placing posts, placing comments, “liking” content and chatting on social media messengers).

Finally, *explicit attitude towards social media* was captured as a control variable with an established scale adapted for social media (Gangadharbatla 2008) (six items, e.g. “Please indicate the extent of how you feel about your attitude towards social media: unpleasant/pleasant, boring/interesting, negative/positive” etc.).

5.3 Testing Procedure

The full survey was tested to ensure social media users of different ages could easily understand the questions and to ensure no ambiguities in the survey logic. The main task of the test was to examine the overall logic and clarity of the survey design. The testing procedure was reproduced in conditions which were close to the real survey. Findings of the test were expected to reveal whether even any minor changes are required to improve the main survey.

5.3.1 Testing Sample

For the testing, ten participants were invited to go through all sections of the survey. Participants of the test were not aware of all the purposes of the study and they were not necessarily excessive social media users. Participants were aiming to check whether all survey items and instructions were clear rather than provide the researcher with data to analyse. Regarding the main occupation, seven out of the ten participants were PhD colleagues of the researcher. Two more respondents were not related to the science field and teaching occupations. The tenth respondent was a 14 y.o. high school student. Though 18 years old is the minimum age for participating in the study, testing by a high

school student provided us with feedback from the youngest age group. Participants were asked to give their opinion about the overall logic and clarity of the survey and to report on the time they spent. All feedback was provided both verbally or in written (e-mail) form.

5.3.2 Test Results

The overall impression of participants about the logic of the survey was positive. All participants reported that they had no noticeable difficulties in understanding instructions for the study including the SC-IAT. They described this study as “not lengthy” and “clear enough”. All received comments were connected primarily with the meaning of certain survey items rather than survey instructions.

Several minor amendments were made according to suggestions from the test participants. First, two comments related to the Information Sheet and the withdrawal procedure. One of the participants claimed that it was necessary to mention that if a participant withdrew, the researcher would remove the information provided by the participant if such a request was made prior to the compilation of the project output. The Information Sheet was adjusted accordingly. Another comment suggested using a passive voice instead of active, for example, using “you are invited” instead of “I invite you”. This adjustment was not implemented in order to remain consistent with the tone of voice of the HEC Information Sheet template.

With regard to the self-report questionnaire, two participants were concerned about the meaning of using social media for “personal purposes” because they used social media as a leisure activity only. Meanwhile, Caplan and High (2006) describe examples of professionals who are working with internet and social media on a daily basis. Investigators for this study are representatives of similar professionals too. To avoid any

misinterpretations, the words “personal purposes” were changed to “personal (not professional) purposes”. The second amendment related to a question on the number of log-ins to social media during a day. Participants suggested using “once” instead of “1 time/day or less” for this item. Initially, this item was borrowed from the Facebook Activity Measure scale (FAMe) (Tran 2012) and was followed by numerical options for a reply. However, the wording of the response was changed to “once per day or less” to avoid misunderstandings.

Finally, two participants in the pre-test suggested incorporating a progress bar for the whole study. This suggestion could hardly be implemented for two main reasons. The first reason is that a progress bar could not be incorporated for the SC-IAT section without interfering with the test programming code. The second is that technically, the current study consisted of three different surveys on Qualtrics which were linked to each other. In this case, a progress bar could be implemented for each separate survey but not for the whole study. Then, a progress bar could be somewhat misleading because its progress would not correlate with the actual number of questions and the required time.

It was important that participants did not have any issues or difficulties in going through the SC-IAT section of this study. Several test participants called the interactive task “a game” and found it interesting to go through this test. Only one participant mentioned that it made him feel “a little bit of pressure” because he had to react immediately. This participant appeared to be older, in contrast with the others, which could explain a certain degree of emotional inconvenience in dealing with new technologies. Also, there was a comment from one of the participants that he had difficulty with allocating the words “rotten” and “stink” to one of the attribute dimensions, which are “pleasant” and “unpleasant”. Though this participant was not a native English speaker, these words were

changed to “prison” and “hatred” which are borrowed from the same list of pleasant-meaning and unpleasant-meaning words (Greenwald et al. 1998). Finally, all participants attempted to define the main purpose of this computerised task. All of them assumed that SC-IAT checks the way they link stimuli to certain categories; however, no one considered the reaction time. It demonstrated that participants of the survey were focused on the task, and, therefore, a bias in the results was minimised.

Regarding duration, it was expected that the study would take at most 30 minutes of participants’ time while all of them reported that it took them no more than 20 minutes in total. According to statistics from Qualtrics, the average time for all participants was 23 minutes which coincided with the average self-reported duration. The average duration for the SC-IAT section was 7.3 minutes which demonstrated that there were no procedural difficulties which could potentially prolong the required time for the survey. However, it was considered that participants of the test aimed to check the clarity of questions rather than give a correct reply. Therefore, they were expected to go through the current study faster than real participants. For this reason, the expected duration of the survey in the Information Sheet was changed from 40-45 to 30-35 minutes. This is less than the time defined before the test and more than reported by the test participants.

All the above-described comments were implemented in the survey for the main data collection. The implemented adjustments were not considered to be major changes; therefore, it was not submitted to the Human Ethics Committee again.

5.4 Recruitment of Respondents

Based on recent cases of data contamination on MTurk (Bai 2018a; Hulland and Miller 2018), I felt it was important to explore possible reasons for this and ways to protect data for this survey.

5.4.1 Data Quality Issues Related to MTurk

Launched in 2005 by Amazon (Hulland and Miller 2018), Mechanical Turk (or *MTurk*) provides a fast and efficient way to collect research data on the Internet. However, a rapid increase in using MTurk for social studies stimulated more investigations on the reliability of data collected via the platform (Follmer, Sperling, and Suen 2017; psychologicalscience.org 2018). Researchers list a number of known MTurk weaknesses including non-representativeness, self-selection and participant misrepresentations. The last issue becomes a reason for considerable misinterpretations of study findings. Scholars (Hulland and Miller 2018) describe an example when MTurk workers define themselves as smokers who are over 50 for one survey and young sportsmen for another being attracted by a high payment rate. Additionally, Bai (2018a) stresses a noticeable number of low-quality responses from the same geolocations. To come up with this conclusion, the researcher divides his study participants into those with duplicating geolocation and unique ones. Then, the researcher compares a number of the same indicators for both groups. All indicators provide evidence of the randomness and poor quality of replies from the same geolocations.

Additionally, it is particularly important to consider possible data contamination on MTurk for IAT studies. Ryan (2018) conducted an IAT study about the impact of political advertising on the implicit and explicit attitude to it. The researcher reveals responses with a duplicating geolocation from respondents being all men of 30 years old who used similar short wording to answer open-ended questions. The investigator reports the failure rate of 30% for IAT with 95% of responses being too fast from the same duplicating geolocation. To compare, the researcher conducts the same IAT on a not-MTurk sample and reports 3% of invalid IAT scores. Summarising his finding, Ryan

(2018) suggests that multiple responses on MTurk are generated from one entity. The researcher warns that IAT data contamination can be substantial and concludes that problematic responses are generated technically but under human guidance. These weighty claims could not be ignored by MTurk which has initiated its own examination of similar issues.

5.4.2 MTurk Investigations and Suggested Solutions

To address the concerns of investigators, MTurk (2018b) reviews more than 100 000 of the latest studies and reveals up to 2.5% of responses from duplicating geolocations within each survey. Though MTurk explains that not all duplicating geolocations can be considered as problematic and provides an example of two workers completing a survey from the same city and, therefore, being assigned to the same Internet Provider (IP) address, MTurk reveals a number of locations with workers submitting their responses via “server farms” to hide a true location and conceal their digital footprint.

To explore this issue, MTurk conducts a survey to compare responses from so-called “farmers” and “non-farmers”. To recruit farmers, MTurk checks its database with more than 100 000 studies and 15 million assignments and selects those which are conducted from known server farms. The results of a Big Five Inventory (BFI) questionnaire, a trolley dilemma with clear standards to compare, open-ended questions and English proficiency screener, provide evidence of a sustainable difference between two groups. Responses from farmers demonstrate lower quality and it takes twice as long for farmers to reply. MTurk (2018a) assumes that farmers struggle with difficulties responding in English and take multiple MTurk tasks in parallel. Finally, MTurk concludes that there is no evidence of bots but rather humans from non-English speaking locations using server farms and taking multiple MTurk tasks at the same time.

To move forward, MTurk provides researchers with advanced existing and new tools to get rid of multiple problematic submissions. Out of the known techniques, MTurk advocates for including at least open-ended questions and English proficiency screeners in surveys. In parallel, MTurk recommends scholars use a new advanced TurkPrime platform for behavioural and social sciences (Litman, Robinson, and Abberbock 2017). In this case, researchers recruit MTurk participants and manage their studies via TurkPrime with greater flexibility. Litman et al. (2017) list a number of benefits for academics which includes a higher level of sample representativeness and advanced control over participants. First of all, researchers can use TurkPrime's qualification system (TurkPrime 2018a) which means that workers are already qualified with certain characteristics verified by MTurk. Then, TurkPrime (2018d) provides researchers with several tools to eliminate submissions from server farms, specifically blocking suspicious and duplicating geolocations, showing a demographics panel, identifying workers who have too much experience with similar surveys, verifying a country by IP addresses and others. The efficiency of these tools is proved by internal MTurk investigations (MTurk 2018a, 2018b) when non-farmers are recruited via TurkPrime.

5.4.3 Protective Recruitment Practices

Researchers (Bai 2018a; Ryan 2018) suggest that there is no one single algorithm to avoid data contamination. However, previous findings allow the probability of problematic responses to be minimised. For this exploration, this study draws on the recommendations of other academics (Litman et al. 2017) and use TurkPrime to conduct the study. At the same time, this research follows previously tested techniques to decrease data contamination. In addition to the TurkPrime toolkit, additional protective procedures are

exploited to handle recent MTurk issues with duplicate geolocations and participants' misrepresentation. These practices are described in Table 5.4.3.

Table 5.4.3 Protective Practices to Minimise Data Contamination on MTurk

An Issue	Main Difficulties	Suggested Practices
Not advanced sampling selection	Not sufficiently flexible sampling in terms of demographic criteria.	To use TurkPrime toolkit (2018c) in addition to MTurk techniques. This toolkit includes the TurkPrime advanced qualification system, full demographics panel, and including or excluding specific workers.
Participation of "farmers"	Duplicate geolocations which are used by "farmers"	(1) To use new TurkPrime features to block suspicious and duplicate geolocations and exclude duplicate IP addresses. (2) To check data manually when it is gathered.
	"Copy-paste" or unintelligible responses	To include open-ended questions to test the quality of responses (Bai 2018a; MTurk 2018a, 2018b; Ryan 2018). Poor or duplicate responses to open-ended questions are one of the main indications of problematic participants.
Participants' misrepresentation	Non-relevant replies	To pay a fair reward to MTurk workers which is neither too high nor too low (Hulland and Miller 2018). In other cases, MTurk workers are driven by a high payment and misrepresent themselves to fit sampling criteria.
	Non-English speakers	Include English proficiency screener which defines non-native speakers from other locations.
A wrong survey flow	A high risk of the data contamination for the full sampling size	To collect data in two steps:
		Step 1. Paid screening survey to qualify participants and decrease the number of workers not matching sampling criteria. Step 2. Full-scale study includes invited qualified participants when the data quality is checked for low expenses.

First, researchers and MTurk (Hulland and Miller 2018; MTurk 2014; TurkPrime 2018a) recommend starting with a short screening survey to define participants for the main study. The screening survey aims to decrease the number of workers who do not match the qualification criteria. Moreover, if workers are disqualified at the beginning of the

long study, they are not compensated for their time spent which forces them to provide fake responses and meet necessary criteria. Following this recommendation, this study conducts the screening survey as the first recruiting stage. To pay a fair reward, payments for other MTurk studies which took a similar amount of time from participants are considered. In this way, participants of the screening survey were paid USD 0.30 per response while qualified participants of the main study were paid USD 2.50.

Second, open-ended questions make it possible to clean data from entries with obvious “copy-paste” responses. Hui Bai (2018b) explains that problematic responses from duplicating geolocations often use a typical word such as “very”, “good”, “nice” regardless of what is asked. The same words for problematic participants are mentioned by Ryan (2018) in his IAT study. The current research included two open-ended questions. The first open-ended question in the screening survey asked participants to describe how to follow a user on social media. Excessive social media users are expected to be aware of the main social media functional features and be able to give a fast response to this question. The second question of this type asked participants to describe their experience taking the survey at the end of the study.

Finally, this research joins concerns of other investigators on the relevant locations of participants. To address this, an English proficiency screener was borrowed from the MTurk investigation of problematic responses (MTurk 2018a). Participants were asked to select the most related words to “moody”. Synonyms and antonyms for this word were taken from the Collins Dictionary (collinsdictionary.com 2019). In this way, suggested practices were expected to create an additional protective procedure to handle recent MTurk issues with duplicate geolocations and participants’ misrepresentation.

5.4.4 Sociodemographic Criteria

Based on the findings of Study One, it was important to make a decision on the age of participants for the current study. For this, this study drew on the statistics of an average social media profile. Facebook is an undoubted leader among all existing social media platforms. Being used by almost 38% of the world and having more than 33% of the world's population as active users (Statista.com 2020b; Wearesocial.com 2019), Facebook has become almost synonymous with social media use. More than 74% of the Facebook audience is represented by the 18-44 age group with the following split: 27% of 18-24 years, 32% of 25-34 years and 16% of 35-44 years. The current number of male users on Facebook is slightly higher (57%) than female users (43%).

As a result, the following criteria are used for the sampling selection in this study. First, participants needed to be social media users, which means that they have their personal account and use it regularly. The next criterion was the duration of daily social media use. Currently, an average user spends 2 hours and 23 minutes on social media every day (GlobalWebIndex 2019). Therefore, this study invited participants who use social media daily or almost daily and spend, on average, two hours or more per day on it. The third criterion to participate in the study was age. Participants were expected to be in the 18-44 age group which represents a core Facebook user. Technically, the screening survey was conducted in three parallel studies which recruited three age groups of social media users (18-24 y.o., 25-34 y.o. and 35-44 y.o.). This approach increased the external validity of the current research making it more possible to generalise study findings afterwards. Finally, the TurkPrime recruitment platform allows tracking of the main sociodemographic criteria during the recruitment process. It allows for the recruitment criteria to be changed if researchers observe the tendency for an imbalance between

different sociodemographic groups. Appendix 6 shows all items of the screening survey for Study Two.

5.5 Ethical Approval

Ethical approval was received from the University of Canterbury Ethics Committee as shown in Appendix 9. Prior to the study, participants had to read the Information Sheet (see Appendix 10) which explained that the completion of this online survey provides informed consent for the use of the response in the study. Also, participants were informed about the duration of the survey and the sequence of main survey sections.

Participation in this study was voluntary and confidential. According to the University of Canterbury ethical requirements, data and identities were stored on a password-protected computer and will be retained for ten years, after which the data will be destroyed.

5.6 Chapter Summary

Chapter Five provided an overview of the quantitative research design which is developed to test hypotheses introduced in Chapter Four. This is one of the first known attempts to join implicit and explicit measurements in a study on the social media context. Though all used measurement tools are acknowledged and reliable, it becomes a challenging and responsible task to adapt scales and tools, join them in a reasonable manner and manage the quality of responses. This chapter described two key stages of the methodology planning process. First, the sequence of measures is introduced. Second, this part of work provided details on SC-IAT design, self-report questionnaire, filler tasks and control variables. Third, this chapter reported the results of the testing procedure which did not reveal any difficulties in the understanding of the study aims and instructions. The fourth step justified the selection of platforms both for the research and

for the recruitment process. In summary, this research was designed and conducted through several platforms including Qualtrics, R Studio Software (rstudio.com 2019), iatgen open-source tool (Carpenter et al. 2017) and TurkPrime. Participants of the study were recruited among MTurk workers via TurkPrime recruitment tools. Finally, the ethical approval was confirmed by the UC Human Ethics Committee which allowed us to proceed with the recruitment and data collection for the main study.

Chapter 6. Study Two: Results

6.1 Introduction

Chapter Six presents the summary of the statistical analysis which is conducted to test hypotheses introduced in Chapter Four. For this research, data analysis is conducted using both descriptive and inferential statistics.

First, this chapter describes the data collection process including sample and sample composition. Second, prior to descriptive statistics, SC-IAT data is analysed and interpreted via R Studio Software. Third, the SC-IAT analysis is followed with the descriptive statistics by using the Statistical Package for Social Sciences Programme (SPSS), version 25. Fourth, factor analysis and analysis of scale reliability are conducted in the same programme to check whether proposed factor structures are consistent with the actual data and to ensure the reliability of internal consistency. The descriptive data analysis is followed by inferential statistics which is the fifth step. For this, Partial least squared SEM (PLS-SEM) is applied. The research model is analysed and interpreted in two appropriate stages, specifically the measurement and the structural model (Henseler, Hubona, and Ray 2016). For the PLS analysis, the SmartPLS software is used (v.3.2.7). Finally, I provide a brief overview of the control variables tested. This chapter ends with the summary of hypotheses tested.

6.2 Data Collection

6.2.1 Sample Size

The research starts from a short paid screening survey to qualify MTurk workers for the main study. The screening survey pursued three main objectives. First, a paid screening survey is strongly recommended by MTurk (MTurk 2014; TurkPrime 2018a) as it is expected to reduce the intention of participants to provide false information. In parallel,

this study addresses recent disturbing findings of other researchers on data contamination on MTurk (Bai 2018a; Hulland and Miller 2018; Ryan 2018) and used a screening survey as one of the protective practices from problematic responses. Second, a screening survey made it possible to recruit a sample which corresponds to the main qualification criteria such as sociodemographic characteristics, social media use, the availability of a keyboard and time spent on social media daily. The third reason was to test the English language fluency. In the results, the screening survey aims to provide an approximately even geographical distribution of participants to avoid the impact of cultural differences on social media use.

Overall, 1100 MTurk workers completed the screening survey. To reveal problematic responses, data was cleaned from cases with missing data, not relevant answers for the English proficiency screener and an open-ended question. Then, the cases of participants who spend less than two hours on social media daily were excluded. As a result, 754 MTurk workers out of 1100 were qualified to participate in the main study. All of them were invited to participate in an online single-category implicit association test (SC-IAT) and complete a self-report survey. Participants had a right either to participate in the survey or reject it. The invitation resulted in data collection from 490 respondents, aged 18–44. The number of participants' locations was limited to Australia, Canada, Ireland, New Zealand, the United Kingdom and the United States as English-speaking countries with the highest level of social media penetration (Wearesocial.com 2019). All participants reported spending more than two hours on social media daily. According to recent findings, users themselves consider spending more than two hours on social media to be excessive use (Galer 2018) while researchers (Sampasa-Kanyinga and Lewis 2015) provide evidence that social media use of more than two hours is associated with psychological distress and the need for mental health support. Therefore, this amount of

time on social media can be considered as one of the indicators of excessive social media use. Both for the screening and the main survey, each participant had to submit a unique Dynamic Completion Code which was manually approved by the researcher to verify unique entries.

The process of cleaning the main data was conducted in two stages. At the first stage, the researcher inspected data manually and excluded cases with missing data, repetitive similar responses and irrelevant or meaningless answers for an open-ended question which resulted in 416 cases. At the second stage, this study addressed the concerns of academics (Ryan 2018) about possible data contamination for IAT studies and checked all SC-IAT responses. This process is described in further detail in Chapter 6.3.1 and resulted in 389 responses for the final data analysis.

6.2.2 Sample Composition

Respondents' profiles were analysed both from the demographic and social media use perspective. Table 6.2.2 demonstrates the distribution of socio-demographic characteristics of the sample. Respondents were almost equally male (54%) and female (45%), either partnered (45%) or not partnered (46%) with a reasonably even age distribution: 18–24 years (38%), 25–34 years (34%) and 35–44 years (28%). The prevailing number of young respondents (38% of 18-24 years) explains the highest percentage (46%) having bachelor's degrees for the sample. With regard to employment, 58% were full-time employees, 14% were students and 13% held part-time jobs.

Table 6.2.2 Demographic Profile of Respondents

Demographic profile	Characteristics	Frequency (%)
Gender	Male	54
	Female	45
	Other	1
Age	18-24	38
	25-34	34
	35-44	28
Partnership status	Non-partnered	46
	Partnered	45
	Other	9
Education	Bachelor's or equivalent level	46
	Secondary education	18
	Current student	14
	Master's or equivalent level	13
	Primary education	3
	Doctoral or equivalent level	2
	Other	4
Employment	Paid full-time employee	58
	Student	14
	Paid part-time employee	13
	Self-employed	8
	Other	7

Daily social media use (as shown in Table 6.2.3) mainly fell in the two- to the three-hour range (40%) and three- to the five-hour range (40%). Almost 80% of participants spent up to 75-100% of their online time on social media. More than 60% of respondents logged on 10 or more times per day and spent more than 11 minutes per session. Facebook was the most popular social media platform among participants (86%) with 49% of participants having more than 300 personal connections.

Table 6.2.3 Social Media Profile of Respondents

Social media profile	Characteristics	Frequency (%)
Daily use duration	between 2 to 3 hours	41
	between 3 to 5 hours	40
	more than 5 hours	19
Time on social media out of all time online	51-75%	43
	76-100%	36
	25-50%	19
	less than 25%	2
Number of daily log-ins	over 15 times/day	34
	10-15 times/day	33
	5-9 times/day	25
	2-4 times/day	8
The duration of each session	21 minutes to an hour	35
	11 to 20 minutes	32
	more than an hour	17
	5 to 10 minutes	15
	less than 5 minutes	1
Social media platform*	Facebook	86
	YouTube	77
	Instagram	76
	Twitter	53
	Reddit	50
	Tumblr	15
	Other	11
Social media connections	501-1000	25
	301-500	24
	101-300	21
	more than 1000	18
	1-100	11
	Do not remember	1

Notes: * Multi-answer question

6.2.3 Feedback of Participants

To prevent data contamination, participants were asked an open-ended question about their overall opinion about this study at the end of the survey. The feedback of participants about the structure of the current survey was primarily positive, e.g. “It was a great experience really enjoyed it”, “This was a very original style of research survey that

included a lot of tasks that I have never seen before”, “The survey was easy to get through, and it was easy to comprehend” etc.

With regard to SC-IAT, the survey received rather positive than negative feedback, such as “interesting. I would do it again”; “I enjoyed the challenge of choosing positive and negative images. It is interesting to see how your mind has a hard time switching quickly from one category to another”; “Interesting tasks using the two categories” or “Seemed very easy”. Similar to results of the testing procedure, participants were interested in the overall aim of the interactive task: “I thought the game was interesting. I would like to know the purpose of it”. Just a few occasional comments suggested that the interactive task was a bit difficult, e.g. “I hate the quizzes where i have to hit one button and then hit the same button with different results. It confuses my reptile brain.”

Overall, the feedback of respondents demonstrates that they enjoyed the survey experience though it was longer compared to standard self-report online surveys.

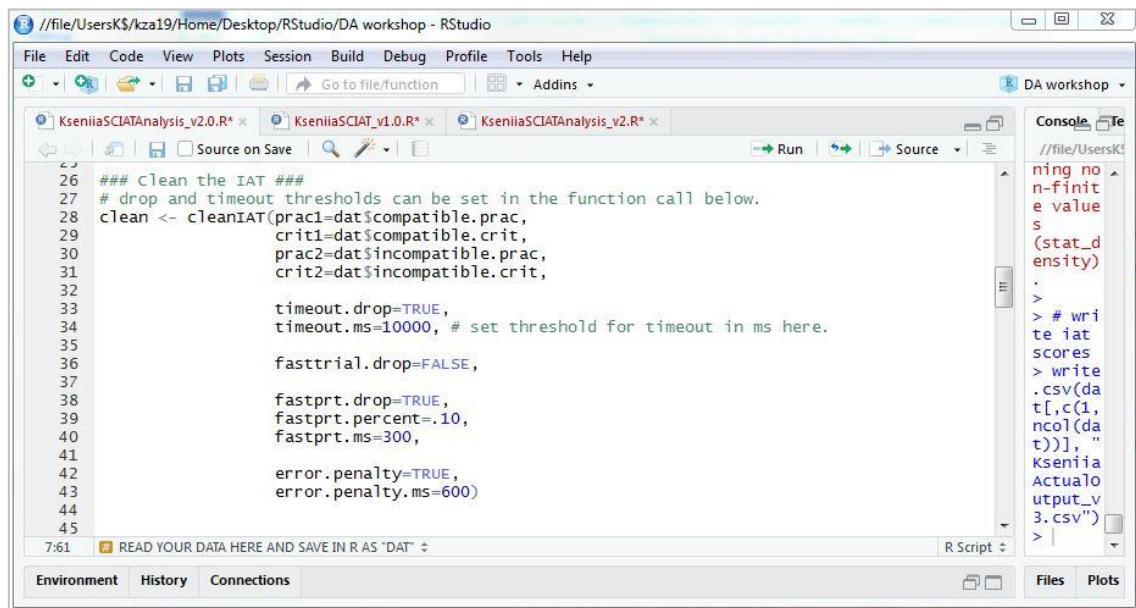
6.3 SC-IAT Data Analysis

6.3.1 SC-IAT Data Cleaning

The process of data cleaning was not limited by the manual inspection of data by the researcher. One of the primary concerns for the current study is a possible high error rate of the SC-IAT because of recent problematic responses on MTurk (Bai 2018a; Hulland and Miller 2018), specifically with the IAT test (Ryan 2018). To clean the SC-IAT data, the researcher followed the process described by Greenwald et al. (2003). Academics claim that two types of respondents need to be excluded before analysing data. First of all, researchers need to remove respondents with a reaction time over 10,000 milliseconds which is more than a quarter of an hour. It is assumed that these respondents are distracted

in favour of some other activity, therefore these responses cannot be considered. Secondly, participants who responded faster than 300 milliseconds on over 10% of trials are to be excluded too because they are considered to be too “fast”. Therefore, this study reports trials with these types of errors and exclude them from the analyses. For this, relevant commands are scripted in R (as shown in Figure 6.3.1)

Figure 6.3.1 Fragment of the R Script for SC-IAT Data Cleaning



All 416 participants completed the SC-IAT with one participant outside the reaction time limit over 10,000 milliseconds and 23 participants with an excessive speed of reaction. Another three participants had a web browser error during this survey. For this reason, the SC-IAT data of 27 respondents is not usable and it is not included in data analysis. Overall, 27 excluded invalid responses make up 6.5% of the overall data out of 416 participants. In this way, the SC-IAT reliability rate is .75 which fits the range from .7 to .9 and confirms a good internal consistency (Rezaei 2011). In summary, the cleaning of the SC-IAT data resulted in 389 responses for the data analysis.

6.3.2 SC-IAT Results

The main indicator of SC-IAT data analysis is a personal standardised D-score or D measure within a range of -2 to +2 (Greenwald et al. 2003). D-scores are computed as the mean difference divided by the standard deviation in the R Studio software (rstudio.com 2019) and represent mental associations to the target category. A positive D-score means that a participant is faster in the compatible block while a negative one indicates that a participant is faster in the incompatible block (Carpenter et al. 2018). In the current research, a positive D-score indicates mental associations of the “social media” target category with the “pleasant” attribute dimension while a negative D-score defines these associations with the “unpleasant” one. For this sample, this study resulted in 84 negative D-scores which represents 22% out of 389 cases and 305 participants (78%) had positive D-scores. Greenwald et al. (2003) suggest reporting “strong”, “medium”, “slight” or “little or no” IAT results in correspondence with conventional criteria for effect sizes of Cohen’s d measure. IAT developers (Greenwald, Banaji, and Nosek 2019; millisecond.com 2016) suggest the cut off values for a slight (.15), moderate (.35) and strong (.65) implicit attitude. Participants with a positive but lower than .15 value are considered to have no definite association with the subject of the research. Following this classification, 76 cases which make up 25% of all positive D-scores, have neither a negative nor a positive association with social media. Meanwhile, 107 cases (35% of all positive D-scores) have a slightly positive implicit attitude, 104 cases (27%) have a moderately positive one and 18 (6%) have a strongly positive implicit attitude to social media. D-score results are merged with the data from Qualtrics for further analysis in SPSS and SmartPLS.

6.4 Scale Reliability and Descriptive Statistics

Descriptive statistics were calculated for all scales on SPSS and are reported in Table 6.2.4. The table includes the means, standard deviation (SD), skewness, kurtosis and the correlations for all main and control variables.

SD for D-score is high (.3) and exceeds its mean (.2) which suggests the widespread of this data. Of the 13 measures, three were not reported to be normally distributed such as Partnership Status, Employment and Time on Social Media. All of these measures are control variables. Two of them, namely Partnership Status and Time on Social Media, showed substantial negative kurtosis which indicates a relatively flat distribution for these scales while for Employment a distribution is relatively peaked (Hair Jr, Hult, Ringle, and Sarstedt 2016). The correlation matrix provided in Table 6.2.4 shows that all correlations for main variables are significant which supports the validity of constructs. The correlations between the main variables are positive except Self-control; many of them are moderate and strong. The strongest positive significant correlation (.72**) is reported between Poor Well-being and Excessive Social Media Use which are the main variables of this study. At the same time, there are few significant correlations for control variables and there are no strong and significant correlations among them. The strongest positive significant correlation for control variables (.38*) is indicated for Frequency of Social Media Use and Impulsive Social Media Use.

Table 6.2.4 Study Two. Descriptive Statistics and Correlations

	Mean (SD)	Kurtosis (Skew)	1	2	3	4	5	6	7	8	9	10	11	12
(1) D-score	.2 (.3)	-.1 (-.2)	1.00											
(2) Impulsive Social Media Use	21.1 (4.4)	-.26 (-.11)	.21**	1.00										
(3) Excessive Social Media Use	19.9 (4.5)	-.26 (.4)	.12*	.41**	1.00									
(4) Poor Well-being	18.1 (5.3)	-.68 (-.06)	.13**	.72**	.41**	1.00								
(5) Self-control	12.9 (3.4)	.12 (.01)	-.12*	-.27**	-.30**	-.26**	1.00							
(6) Explicit Attitude to Social Media	21.4 (4.7)	-.2 (-.26)	.05	.11*	.14**	.11*	.04	1						
(7) Age	29.5 (7.2)	-.98 (.45)	.07	.00	.00	-.03	.03	-.08	1					
(8) Gender	1.5 (.5)	-.4 (.49)	-.10*	-.20*	-.17**	-.07	.02	-.05	-.06	1				
(9) Partnership Status	1.7 (.8)	-2.74 (1.51)	.17**	.07	.00	.12*	-.12*	.04	-.17*	.06	1			
(10) Education	3.7 (1.3)	.67 (.33)	.06	-.04	.02	-.06	.02	-.03	.07	-.4	.03	1		
(11) Employment	2.4 (1.3)	3.14 (1.75)	.07	.03	.02	-.02	-.03	-.05	.11*	.01	.06	.00	1	
(12) Time on Social Media	4.8 (.7)	-1.12 (.39)	.01	.13*	.21*	.13*	-.08	.18*	-.03	-.11*	.04	-.09	.06	1
(13) Frequency of Social Media Use	3.9 (1.0)	-.76 (-.44)	.07	.38*	.13**	.22**	-.08	.15**	.00	-.12*	-.08	.04	.02	.2**

Note: SD: Standard Deviation; Skew: Skewness. **Correlation is significant at the .01 level; * Correlation is significant at the .05 level.

6.5 Factor Analysis

The preliminary data analysis is finalised by using exploratory factor analysis (EFA) as a predecessor to structural equation models (SEM). For this, SmartPLS software is used to define if any items needed to be extracted before the main data analysis. Hair et al. (2016) claim that outer loadings define the absolute contribution of an item to its construct and are interpreted both for reflective and formative constructs. Table 6.5.1 shows the outer loadings for each item of all four components except the implicit attitude variable. One item of the self-control component, particularly SC5, is lower than .5. According to Hair et al. (2016), any item between .4 and .7 can be left out by researchers from the reflective construct in case it does not change the meaning of the construct. As soon as the removal of the SC5 item does not change the meaning of the factor, it was removed from the scale. All other items show a relatively high value for outer loadings, greater than .6, and all of them are taken forward to the data analysis.

Table 6.5.1 Outer Loadings

	Impulsive Social Media Use	Excessive Social Media Use	Poor Well-being	Self-control
ISMU1	.764			
ISMU2	.802			
ISMU3	.669			
ISMU4	.754			
ISMU5	.750			
ISMU6	.671			
ESMU1		.704		
ESMU2		.708		
ESMU3		.729		
ESMU4		.669		
ESMU5		.735		
PWB1			.739	
PWB2			.701	
PWB3			.727	
PWB4			.787	
PWB5			.806	
PWB6			.782	
SC1				.711
SC2				.732
SC3				.758
SC4				.678
SC5				.487

Note: ISMU = Impulsive Social Media use; ESMU = Excessive Social Media Use; PWB = Poor Well-being; SC = Self-control

After the factor analysis, the core characteristics of the measurement model were summarised and listed in Table 6.5.2. Cronbach's alpha proves a high level of reliability, or internal consistency, for all scales starting from .70 for self-control to .85 for poor well-being. It fits the threshold between .7 and .9 suggested by Hair et al. (2016) as satisfactory for advanced stages of the research.

Table 6.5.2 Summary of Constructs

Construct name	Coding	The initial number of items	The number of items after the factor analysis	Cronbach's alpha
Impulsive Social Media Use	ISMU	6	6	.83
Excessive Social Media Use	ESMU	5	5	.75
Poor Well-being	PWB	6	6	.85
Self-control	SC	5	4	.70

6.6 Partial Least Squares Structural Equation Modeling Analysis

Descriptive data analysis is followed by inferential statistics. For the inferential statistics, structural equation modelling (SEM) is applied. SEM allows researchers to use a hypotheses-testing approach and explore relationships between multiple independent and dependent constructs simultaneously (Haenlein and Kaplan 2004; Hair Jr et al. 2016). According to Hair et al. (2016), there are two types of SEM which are used by investigators, namely the covariance-based SEM (CB-SEM) and a variance-based one. The partial least squared SEM (PLS-SEM) which is also called PLS path modelling is considered to be one of the “most fully developed” for the variance-based SEM (Henseler et al. 2016). To test hypotheses, PLS-SEM analysis was used for the following reasons. First, PLS is more data-driven than strictly theory-driven. In other words, it has an exploratory and a predictive nature rather than a verifying and a confirmatory one (Ong and Puteh 2017). Adding to this, researchers (Bolander, Saturnino, Hughes, and Ferris 2015; Henseler et al. 2016) recommend this method before progressing with any experimental design. Second, in contrast to covariance-based structural equation modelling (CB-SEM), PLS-SEM is less sensitive to the sampling because of its ability to divide a complex model into sub-models (Haenlein and Kaplan 2004; Hair Jr et al. 2016; Roldán and Sánchez-Franco 2012). Hair et al. (2016) describe a “ten times rule” which means that the sampling size needs to be a minimum of 10 times larger than the largest

number of structural paths directed at a certain single construct. However, researchers (Hair Jr et al. 2016; Ong and Puteh 2017) outline that it is preferable to use a bigger sample size than required to be able to generalise the research outcome. For this research, the sampling size was at least five times higher than the required minimum. Fourthly, according to Ong et al. (2017), PLS makes it possible to analyse multiple moderation effects and possible indirect effects which are considered to be the mediation in PLS (Hair Jr et al. 2016). It is important for the current study because of its predictive rather than confirmatory nature. Finally, PLS is widely used in the business and social sciences, particularly in the context of information systems and new technologies (Hajli 2018; Henseler et al. 2016; Ong and Puteh 2017; Roldán and Sánchez-Franco 2012). PLS-SEM analysis was executed in two main sequential stages. Considering all the above described reasons, PLS is expected to be a reliable methodological approach to answer research questions for the current study.

6.6.1 Path Analysis of the Conceptual Model

Similar to any SEM approach, PLS consists of the measurement and the structural model (Henseler et al. 2016). Therefore, the research model is analysed and interpreted in two appropriate stages. For the PLS analysis, this study employs the SmartPLS software (v.3.2.7) which is considered to include recent developments and techniques in the PLS area (Henseler et al. 2016; Ong and Puteh 2017).

6.6.1.1 The Measurement Model

The assessment of the measurement model defines the reliability, convergent and discriminant validity for each construct. The main aim of this stage of data analysis is to show the adequacy of all constructs to proceed with the structural model evaluation (Henseler et al. 2016).

Reliability

Traditional criteria for the evaluation of reliability are composite reliability and Cronbach's alpha. Data analyses proved all constructs reliable, with Cronbach's alphas ranging from .70 to .85 and composite reliabilities (CRs) ranging from .815 to .890 (Fornell and Larcker 1981) (see Table 6.6.1). These values exceed the traditional evaluation criteria of .7 (Hair Jr et al. 2016) and provide evidence of an appropriate level of reliability.

Table 6.6.1 Quality Criteria: Reliability, Convergent Validity and Prediction Relevance

Construct and item	Outer loadings	Cronbach's alpha	AVE	CR	R ²
ISMU1	.764	.83	.543	.876	.141
ISMU2	.803				
ISMU3	.668				
ISMU4	.754				
ISMU5	.751				
ISMU6	.670				
ESMU1	.704	.75	.503	.835	.233
ESMU2	.708				
ESMU3	.729				
ESMU4	.669				
ESMU5	.735				
PWB1	.739	.85	.575	.890	.555
PWB2	.701				
PWB3	.727				
PWB4	.787				
PWB5	.806				
PWB6	.782				
SC1	.695	.70	.525	.815	
SC2	.751				
SC3	.771				
SC4	.676				

Note: ISMU=Impulsive Social Media Use, ESMU=Excessive Social Media Use, PWB=Poor Well-being, SC=Self-control.

Validity

The evaluation of validity focuses on two core aspects of convergent and discriminant validity. According to Hair et al. (2016), convergent validity shows the extent of the positive correlation of each measure with alternative measures of this construct. Two criteria of convergent validity are assessed for this study, specifically outer loadings for each item and average variance extracted (AVE). The AVE was higher than .5, which met the required minimum (Hair Jr et al. 2016) and indicated an acceptable level of convergent validity. Almost all outer loadings were higher than .7; for five items, outer loadings exceeded .6. These values meet Fornell and Larcker's (1981) required threshold of .6, though they are lower than the .7 threshold Hair et al. (2016) suggest. However, Hair et al. (2016) note that items with outer loadings between .4 and .7 can be retained if eliminating them does not lead to higher CR for constructs or their removal affects content validity. For this data, all outer loading values either exceeded or were close to the threshold of .7, and removing them did not result in a higher CR. Therefore, the use of all items was justified for further analysis, and the convergent validity of the measurement tools is supported.

The next aspect of the validity evaluation is the assessment of the discriminant validity which is conducted for reflective constructs (Hair Jr et al. 2016). Henseler et al. (2016) claim that discriminant validity shows the extent of the distinction of a certain construct from other constructs. Discriminant validity was assessed with both the Fornell–Larcker (Fornell and Larcker 1981) criterion and the recent heterotrait–monotrait ratio correlations (HTMT) (Henseler, Ringle, and Sarstedt 2015). The Fornell–Larcker criterion is one of the common methods which requires comparison of the cross-loadings of each item in the constructs and the square root of AVE for each of them. This criterion justifies the validity when the square root of the AVE for each construct is higher than all

correlations between one construct and all other constructs. For the current study, the AVE of each latent variable exceeds the correlation between factors which can be seen by the off-diagonal values in the matrix (Table 6.6.2).

Table 6.6.2 Discriminant Validity Assessment. Fornell–Larcker Criterion

Constructs	1	2	3	4	5
1. Excessive Social Media Use	.709				
2. Implicit Attitude to Social Media	.122	1.000			
3. Impulsive Social Media Use	.413	.218	.737		
4. Poor Well-being	.421	.141	.733	.758	
5. Self-control	-.328	-.111	-.308	-.270	.724

Note: The square root of the AVEs for each construct appears on the diagonal in boldface.

The second criterion for the assessment of the discriminate validity is the HTMT which has been introduced recently and is claimed to be more precise than the Fornell–Larcker criterion (Garson 2016; Henseler et al. 2016). Garson (2016) suggests that the HTMT ratio should be below 1.0 while other researchers insist on a .90 cut-off (Ringle, Wende, and Becker 2015). The HTMT ratio is lower than the cutoff of 1.0 and .9 which confirms that all factors are discriminated from one another (Table 6.6.3). In this way, both criteria provided ratios of the required level, which indicates the discriminant validity of measurement instruments.

Table 6.6.3 Discriminant Validity Assessment. HTMT

Constructs	1	2	3	4	5
1. Excessive Social Media Use					
2. Implicit Attitude to Social Media	.141				
3. Impulsive Social Media Use	.521	.237			
4. Poor Well-being	.519	.147	.850		
5. Self-control	.466	.128	.385	.335	

In this way, the assessment of the above described criteria provides evidence of both the convergent and discriminant validity of the research measurement model.

6.6.1.2 Structural Model and Hypotheses Results

The evaluation of the structural model defines whether empirical data supports the theory which can lead to either a confirmation of the theory or its rejection (Hair Jr et al. 2016). The structural model was assessed by using SmartPLS software; specifically the PLS algorithm and bootstrap re-sampling method are used to define three core criteria (Henseler et al. 2016). The first criterion is path coefficients. The second criterion is path significance which is a *p*-value. Hair et al. (2016) suggest checking both a path coefficient and t-statistic value. Path coefficients values vary from -1 to +1 and the closer it to +1 the stronger the relationship is. Meanwhile, a value which is bigger than .1 is considered as a defined relationship in case it is significant. For t-value, Hair et al. (2016) describe a number of cut-off values depending on the level of its significance: 1.65 value at the significance level of 10%, 1.96 at the 5% significance level and 2.57 at the significance level of 1%. At the same time, they explain that in many studies, particularly for the marketing research area, researchers use a cut-off of 1.96 at the 5% significance level. Therefore, this level depends on the field of study and research questions. The third criterion is the variance explained or R^2 values. While academics agree on R^2 as one of

the main criteria to evaluate the structural model, still there is no definite consensus about an appropriate level for this criterion. Chin (1998) recommends R^2 values should be assessed as weak (.19), moderate (.33) and substantial (.67), while Cohen (1988) suggests a t-value of .02 should be assessed as weak, .13 as moderate and .26 as substantial. Furthermore, Falk et al. (1992) insist that R^2 values should be higher than .1 for the variance explained for an endogenous construct to be considered adequate. Adding to this, Hair et al. (2016) explain that R^2 values of .20 are accepted as high in research areas such as consumer behaviour. Therefore, there are no acknowledged rules concerning high levels of R^2 values. Drawing conclusions about R^2 values, researchers need to consider the context of the current exploration including the main characteristics of the study, the type of data, research aims etc.

Before reporting the results, it is important to consider recent academic discussions on *p*-value. When estimating the significance of path coefficients, this study cannot omit the latest controversies of researchers on redefining default *p*-values (Baker 2016; Benjamin et al. 2018; Chawla 2017). Benjamin et al. (2018) emphasise that the initial selection of a .05 *p*-value threshold by Fisher (1950) was arbitrary. Academics provide a robust justification for their recommendation to replace the current threshold with .005 for higher reproducibility. At the same time, all investigators are united in their claim that results of any study need to be considered within the context, first of all. They agree that sometimes results that do not reach the threshold can still be important for society. Considering all the latest discussions, it is necessary to take into account the background of this study as well. Current gaps in the literature show that the research on excessive social media use is still in its infancy stage and new findings may potentially become avenues for further exploration. However, any assumptions need to be thoroughly tested due to possible biases of online surveys. Therefore, a reasonably strict approach to data

interpretation is also required for findings not to mislead other researchers. In this regard, this study reports path coefficients which reached the threshold of .05 in tables and appendices, though findings include the reflection on the values which reached the threshold of .005.

The evaluation of the structural model confirms the principal part of my hypotheses, though they suggest some unexpected outcomes. Figure 6.6.1 provides a summary of PLS analysis results and includes path coefficients, path significance (p-value), t-value and variance explained (R^2 values) of the structural model. Path coefficients (β) and t-values met the required cutoffs of .1 and 1.96, respectively (Hair Jr et al. 2016), for six of the eight hypothesised paths: H1–H6. Some coefficients noticeably exceeded the critical values (e.g. the path between Impulsive Social Media Use and Poor Well-being) ($\beta = .673$, t-value = 22.597, $p < .001$). All six paths mentioned are positively significant at the .000 and .001 level, which supports H1–H6.

The first hypothesis examined the relationship between Implicit Attitude Towards Social Media and Impulsive Social Media Use. It was hypothesised that Implicit Attitude has a positive association with Impulsive Social Media Use. Path analysis indicates that there is a significant positive relationship ($\beta = .187$, t-value = 4.487, $p < .001$). Based on this, *Hypothesis One was supported.*

The same positive association is justified for Hypothesis Two which explored the relationship between Impulsive Social Media Use and Excessive Social Media Use. The evaluation of the model proves a significant strong association ($\beta = .329$, t-value = 6.593, $p < .001$); therefore, *Hypothesis Two was supported.*

Hypotheses Three and Four investigated the positive association between Impulsive Social Media Use and Poor Well-being; and between Excessive Social Media Use and

Poor Well-being, correspondingly. For both hypotheses, the relationships showed high significant values (H3: $\beta = .673$, $t\text{-value} = 22.597$, $p < .001$; H4: $\beta = .140$, $t\text{-value} = 3.453$, $p < .01$). This proved the significant positive relationship and, therefore, *Hypotheses Three and Four were supported*.

Hypotheses Five and Six aimed to test the negative interaction between Self-control and Impulsive and Excessive Social Media Use, correspondingly. Both relationships demonstrated significant negative associations (H5: $\beta = -.289$, $t\text{-value} = 5.286$, $p < .001$, H6: $\beta = -.224$, $t\text{-value} = 4.249$, $p < .001$). Based on this, *Hypotheses Five and Six were supported*.

As a result, testing of hypotheses demonstrated that some coefficients noticeably exceeded the critical values (e.g. the path between Impulsive Social Media Use and Poor Well-being, $\beta = .673$, $t\text{-value} = 22.597$, $p < .001$). All six paths mentioned are significant at the .000 and .001 level, which supported H1–H6.

Figure 6.6.1 Assessment of the Structural Model: Hypotheses Testing

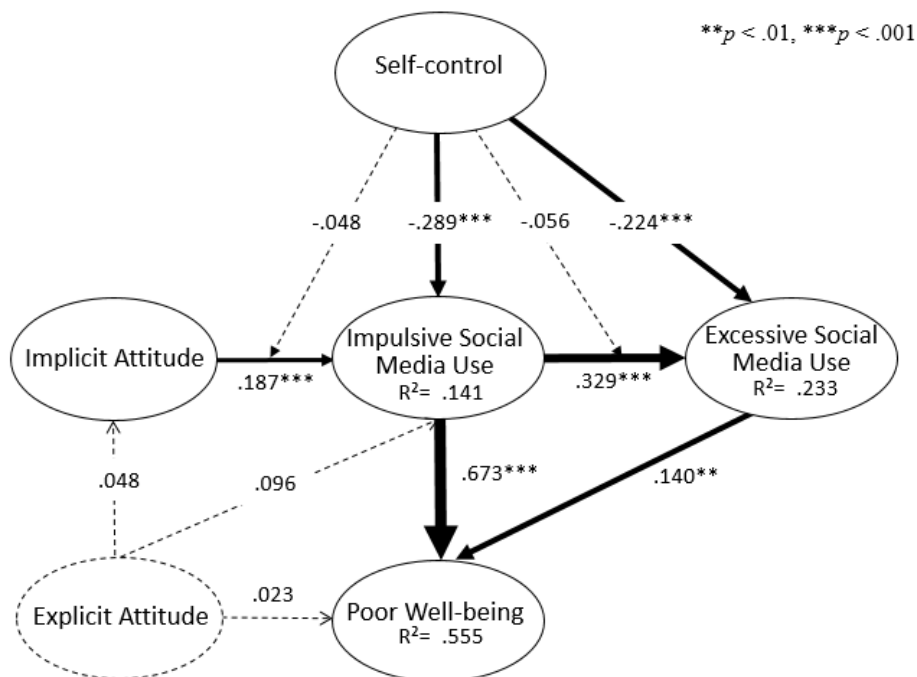


Figure 6.6.1 shows that the variances explained (R^2) by Impulsive Social Media Use, Excessive Social Media Use and Poor Well-being are 14.1%, 23.3% and 55.5%, respectively. This coefficient of determination is considered one of the most commonly used criteria for the structural model assessment and its predictive accuracy, though no consensus about an appropriate level has emerged; researchers have variously claimed lowest acceptable levels of .02, .10 or .19 (Chin 1998; Cohen 1988; Falk and Miller 1992) and suggest relying on the study context. Hair et al. (2016) recommend that R-square values of .20 are accepted as high for studies in consumer behaviour. Meanwhile, Hajli (2014) explores the impact of social media on consumer behaviour and the intention to buy by using PLS analysis. In his model, R^2 of .183 for trust means that 18% of the variance in trust is accounted for by social media. The researcher concludes that a hypothesis about the positive effect of social media on consumers' trust is supported. In this study, the highest R-square for Poor Well-being in the data set means that Impulsive and Excessive Social Media Use accounts for more than 55% of the variance in Poor Well-being. Considering all the discussion above, it is concluded that the paths of H1–H6 are significant and relatively strong.

6.6.1.3 Moderation

The data from the current study does not support two hypotheses on the moderating role of Self-control (H7 and H8) (H7: $\beta = -.048$, $t\text{-value} = .879$, $p > .01$, H8: $\beta = -.056$, $t\text{-value} = 1.245$, $p > .01$); therefore, Self-control does not affect the relationship between Implicit Attitude Towards Social Media and Impulsive Social Media Use or that between Impulsive and Excessive Social Media Use. In other words, highly impulsive and excessive social media users are unlikely to change their unhealthy behaviour by attempting to increase their level of self-control; doing so requires a potential revision of the impact of self-control on other excessive screen media behaviours as well.

Table 6.6.4 shows that the research model is substantially supported by the data, except for H7 and H8.

Table 6.6.4 PLS Results: Test of Hypothesised Relationships

Structural Paths	Hypotheses	β (SE)	T Statistics	f^2	q^2	Hypotheses support
Direct effects						
Implicit Attitude → Impulsive Social Media Use	H1	.187 (.042)***	4.487	.039	.02	Supported: positive relationship
Impulsive Social Media Use → Excessive Social Media Use	H2	.329 (.050)***	6.593	.126	.05	Supported: positive relationship
Impulsive Social Media Use → Poor Well-being	H3	.673 (.030)***	22.597	.844	.27	Supported: positive relationship
Excessive Social Media Use → Poor Well-being	H4	.140 (.040)**	3.453	.036	.01	Supported: positive relationship
Self-control → Impulsive Social Media Use	H5	-.289 (.050)***	5.826	.096	.05	Supported: negative relationship
Self-control → Excessive Social Media Use	H6	-.224 (.053)***	4.249	.059	.02	Supported: negative relationship
Moderating effect 1 → Impulsive Social Media Use	H7	-.048 (.054)	.879	.002		Not supported
Moderating effect 2 → Excessive Social Media Use	H8	-.056 (.045)	1.245	.005		Not supported

Note: β = path coefficient, SE = standard error, f^2 = effect size, q^2 = effect size. ** $p < .01$, *** $p < .001$.

6.6.1.4 Mediation

Beyond multiple moderation effects, PLS allows researchers to analyse indirect effects which are considered to be a mediating effect in PLS (Hair Jr et al. 2016; Ong and Puteh 2017). Although identifying mediation effects was not the main purpose of this work,

data analysis revealed five significant mediating effects, with moderately high path coefficients for two of them (as shown in Table 6.6.5). The first moderately strong significant mediating effect observed was between Implicit Attitude and Poor Well-being, in which Impulsive Social Media Use intervened as a mediator with a 95% confidence interval (CI) excluding 0 ($\beta = .126$, $CI = [.069, .184]$, $p < .001$). This relationship sheds some light on the nature of impulsive social media use. It indicates that users with a positive implicit attitude towards social media can maintain their well-being at an appropriate level by managing the level of their impulsive use. Conversely, the second strong significant mediating effect showed a negative relationship between Self-control and Poor Well-being, with Impulsive Social Media Use again emerging as a mediator ($\beta = -.195$, $CI = [-.266, -.130]$, $p < .001$). Therefore, users with a high level of self-control can suffer from poor well-being, which is again mediated by the extent of their impulsive social media use. In this way, the analysis of indirect effects confirms that Impulsive Social Media Use functions as a mediator for two paths with the same dependent variable of Poor Well-being.

Table 6.6.5 PLS Results: Indirect Effects

Structural Paths	β (SE)	T Statistics
Implicit Attitude → Impulsive Social Media Use → Excessive Social Media Use	.062 (.016)*** (CI = [.032, .096])	3.814
Self-control → Impulsive Social Media Use → Excessive Social Media Use	-.095 (.024)*** (CI = [-.148, -.055])	4.000
Impulsive Social Media Use → Excessive Social Media Use → Poor Well-being	.046 (.016)** (CI = [.019, .082])	2.879
Implicit Attitude → Impulsive Social Media Use → Poor Well-being	.126 (.029)*** (CI = [.069, .184])	4.303
Self-control → Impulsive Social Media Use → Poor Well-being	-.195 (.034)*** (CI = [-.266, -.130])	5.739

6.6.1.5 Control Variables

For control variables, this study followed the approach of Fichman and Kemerer (1997) and provide the evaluation of the structural model for two additional estimated models. This research tests numerous control variables in this exploration; therefore, all of them are divided among two more models. Model 1 is the full theoretical model with just one control variable of Explicit Attitude Towards Social Media included. Model 2 includes demographic control variables such as Age, Gender, Partnership Status, Education and Employment, and two social media use variables namely Time on Social Media and Frequency of Social media Use. Finally, in Model 3, this study is testing the possible relationships of five social media activities on the research model. Before interpreting path coefficients, it was investigated whether there are crucial differences in R^2 values between three models which demonstrate the additional explanatory power of control variables. Table 6.6.6 reports that control variables from both Models 2 and 3 explain a

higher incremental variance (R^2) for Impulsive Social Media Use (from .141 for Model 1 to .276 and .216 in Models 2 and 3, correspondingly). Also, control variables from Model 2 have an impact on the variable of Excessive Social Media Use, increasing the R^2 value from .233 to .259.

Table 6.6.6 Comparison of Structural Models for Models 1-3

Results	Theoretical Model 1	Models with control variables	
		Model 2	Model 3
Number of paths in the model	11	36	28
Number of significant paths in the model	6	12	11
Variance explained (R^2) in Impulsive Social Media Use	.141	.276	.216
Variance explained (R^2) in Excessive Social Media Use	.233	.259	.225
Variance explained (R^2) in Poor Well-being	.555	.560	.560
Path coefficients			
Implicit Attitude -> Impulsive Social Media Use	.187***	.150***	.138**
Impulsive Social Media Use -> Excessive Social Media Use	.329***	.337***	.324***
Impulsive Social Media Use -> Poor Well-being	.673***	.674***	.696***
Excessive Social Media Use -> Poor Well-being	.140**	.156***	.154***
Self-control-> Impulsive Social Media Use	-.289***	-.243***	-.248***
Self-control-> Excessive Social Media Use	-.224***	-.220***	-.214***
Moderating effect 1 -> Impulsive Social Media Use	-.048	-.034	-.053
Moderating effect 2 -> Excessive Social Media Use	-.056	-.059	-.068

Note: Model 1 = the full research model, Model 2= the research model with demographic control variables, Model 3 = the research model with control variables of social media actions

Table 6.6.7 demonstrates significant path coefficients for control variables. First, the relationships for a control variable of Explicit Attitude were tested to compare its impact with the Implicit Attitude. It was found that Explicit Attitude Towards Social Media had no significant correlation with the other variables of the study. Though the path coefficient for the relationship between Explicit Attitude and Excessive Social Media Use is moderately high ($\beta = .118$), the significance value of .013 is arguable and does not fit the updated threshold of $p < .005$ (Benjamin et al. 2018). Therefore, this relationship

cannot be claimed as significant. This finding indicates that no consistent pattern of the impact of conscious attitude on excessive social media use emerged and that conscious intention does not always transform into a relevant behavioural outcome (Govind et al. 2019).

Surprisingly, age and other demographic control variables did not reveal correlations with the main variables of the current study either. Another unexpected finding relates to Partnership which had a positive significant correlation with Implicit Attitude Towards Social Media ($\beta = .187, p < .001$). This showed that non-partnered participants experienced higher levels of the implicit attitude towards social media than those with partners. Also, Gender was negatively correlated with Impulsive Social Media Use ($\beta = -.141, p < .01$), which shows that women were more impulsive on social media than men. As expected, Time on Social Media had a moderate correlation with Excessive Social Media Use ($\beta = .168, p < .001$), and Frequency of Social Media Use showed a strong significant correlation ($\beta = .336, p < .001$) with Impulsive Social Media Use. This result supports other researchers (Blinka et al. 2015; Kuss and Griffiths 2011b; Olufadi 2016; Pontes et al. 2015b) in their suggestions that excessive social media use cannot be evaluated solely by time measurements and other variables need to be involved.

Table 6.6.7 Control Variables. Demographics and Social Media Use

	Path coefficient	p-value
Explicit Attitude -> Implicit Attitude	.048	.331
Explicit Attitude -> Impulsive Use	.096	.048
Explicit Attitude -> Excessive Use	.118	.013
Explicit Attitude -> Poor Well-being	.023	.514
Age -> Implicit Attitude	.089	.091
Age -> Impulsive Use	.002	.973
Age -> Excessive Use	-.005	.917
Age -> Poor Well-being	-.002	.963
Gender -> Implicit Attitude	-.096	.040
Gender -> Impulsive Use	-.141**	.001
Gender -> Excessive Use	-.078	.117
Gender -> Poor Well-being	.074	.029
Partnership -> Implicit Attitude	.187***	.000
Partnership -> Impulsive Use	.060	.167
Partnership -> Excessive Use	-.070	.132
Partnership-> Poor Well-being	.054	.118
Employment -> Implicit Attitude	.048	.351
Employment -> Impulsive Use	.009	.850
Employment -> Excessive Use	.009	.823
Employment-> Poor Well-being	-.038	.234
Education -> Implicit Attitude	.041	.387
Education -> Impulsive Use	-.060	.198
Education -> Excessive Use	.050	.274
Education -> Poor Well-being	-.027	.457
Time on social media -> Implicit Attitude	-.028	.601
Time on social media -> Impulsive Use	.010	.838
Time on social media -> Excessive Use	.153**	.002
Time on social media -> Poor Well-being	.022	.530
Frequency of use -> Implicit Attitude	.071	.189
Frequency of use -> Impulsive Use	.332***	.000
Frequency of use -> Excessive Use	-.083	.102
Frequency of use -> Poor Well-being	-.043	.261

Note: ***Correlation is significant at the .000 level; **Correlation is significant at the .01 level; * Correlation is significant at .005 level

Finally, this study explored possible relationships of the main variables with social media activities (as shown in Table 6.6.8). The highest positive, significant correlation emerged between Chatting on Social Media Messengers with Implicit Attitude Towards Social Media ($\beta = .203, p < .001$) and with Impulsive Social Media Use ($\beta = .180, p < .001$). Data analysis also showed a positive, significant correlation for the relationship between Impulsive Social Media Use and Scrolling Newsfeed ($\beta = .131, p < .05$). These relationships support recent suggestions about the impact of social media stimuli on self-control failures (Du et al. 2019) and perceptions of social media as a credible source of information (Naylor, Lamberton, and West 2012; Westerman, Spence, and Van Der Heide 2014).

Table 6.6.8 Control Variables. Social Media Actions

	Path coefficient	p-value
Chatting on Messengers -> Implicit Attitude	.203***	.000
Chatting on Messengers -> Impulsive Use	.180***	.000
Chatting on Messengers -> Excessive Use	.045	.397
Chatting on Messengers -> Poor Well-being	-.087	.027
Placing posts/content -> Implicit Attitude	.092	.114
Placing posts/content -> Impulsive Use	.129	.021
Placing posts/content -> Excessive Use	.014	.759
Placing posts/content -> Poor Well-being	-.001	.973
Scrolling Newsfeed -> Implicit Attitude	.001	.987
Scrolling Newsfeed -> Impulsive Use	.131*	.003
Scrolling Newsfeed -> Excessive Use	-.013	.786
Scrolling Newsfeed -> Poor Well-being	.015	.657
Placing comments -> Implicit Attitude	-.037	.557
Placing comments -> Impulsive Use	.016	.753
Placing comments -> Excessive Use	.045	.284
Placing comments -> Poor Well-being	-.056	.145
"Liking" content -> Implicit Attitude	.009	.867
"Liking" content -> Impulsive Use	-.027	.432
"Liking" content -> Excessive Use	-.044	.310
"Liking" content -> Poor Well-being	.022	.621

Note: ***Correlation is significant at the .000 level; **Correlation is significant at the .01 level; * Correlation is significant at .005 level.

6.7 Hypotheses Results

Table 6.7.1 demonstrates the summary of tested hypotheses and the interpretation of findings. Six (H1-H6) out of eight hypotheses are supported. In the meantime, not supported hypotheses (H7, H8) result in important theoretical and practical implications too.

Table 6.7.1 Summary of Hypotheses Tested

Hypothesis	Description	Results
H1	Users with a positive implicit attitude towards social media will have a high level of impulsive use. In other words, users with a positive implicit attitude will use social media in a non-planned way and without deliberate intentions.	Supported. Positive implicit attitude increases reported impulsive social media use.
H2	Users who use social media impulsively will have a high level of excessive use as well. In this way, unplanned impulsive use will result in interference in daily routine.	Supported. Impulsive social media use has a positive correlation with excessive social media use.
H3	Users with high impulsive social media use will harm their well-being.	Supported. Impulsive use is positively associated with poor well-being.
H4	Excessive social media use interferes in the daily life of users and will result in poor well-being.	Supported. Excessive social media use has a positive correlation with poor well-being.
H5	Users with an initially high level of self-control will manage to cope with the impact of stimuli and will not have high impulsive social media use. The same will be true for the reverse direction, i.e. users with low self-control will use social media impulsively.	Supported. Self-control is negatively associated with impulsive social media use.
H6	Users with a high level of self-control will not use social media excessively and will manage their daily routine according to life priorities. In contrast to them, users with low self-control will allow social media use to interfere in daily life.	Supported. Self-control is negatively associated with excessive social media use.
H7	Users with high self-control will be able to decrease their level of impulsive use even if their implicit attitude towards social media is positive. In other words, users may have positive non-conscious associations with social media but be able to manage them with their self-control and not use social media impulsively.	Not Supported. Self-control does not play a moderating role in relationships between implicit attitude and impulsive social media use.
H8	Users with high self-control will be able to decrease excessive social media use even if their impulsive use is high. In other words, the user may impulsively react to social media stimuli but still manage their daily routine in a relevant way.	Not Supported. Self-control does not play a moderating role in relationships between impulsive and excessive social media use.

6.8 Chapter Summary

Chapter Six aimed to test the hypotheses described in Chapter Four. The results of the test were presented in Tables 6.6.3 and 6.7.1. This study demonstrated a thorough recruitment process starting from the selection of the survey platform selection to screening survey and data cleaning. These practices of precaution were explained by recent findings of researchers on MTurk data contamination from online surveys. Beyond that, this meticulous approach is relevant for many online studies as investigators cannot observe study participants. The recruitment resulted in a relatively even distribution of the sample in terms of gender (54% were male and 45% female) and age (38% were 18-24 years, 34% 25-34 years and 28% 35-44 years). Applied practices efficiently decreased a possible sample bias and any shifts towards certain socio-demographic groups. Almost all participants in this research were excessive Facebook users which also corresponds to the profile of a worldwide average social media user (Wearesocial.com 2019). In spite of reasonable concerns on possible IAT data contamination, SC-IAT results showed a minor level of problematic responses for the current research. It confirmed the reliability of this tool for online surveys. Descriptive statistics reported high reliability for other used scales as well.

The evaluation of the research model provided support for six out of eight hypotheses, namely H1–H6. This justified findings of the current systematic literature review and interpreted the mechanism of excessive social media use from a new perspective. Meanwhile, H7 and H8 on the moderating impact of self-control were not supported. This raises a number of questions about the potential ability of excessive users to control their own behaviour on social media. Additionally, two significant and relatively strong mediating effects were revealed. These effects showed that Impulsive Social Media Use mediated both the relationship between Implicit Attitude and Poor Well-being, and the

relationship between Self-control and Poor Well-being. These findings provided the theoretical grounding for potentially efficient self-control interventions.

Outcomes on control variables were unexpected to a certain extent. Surprisingly, Explicit Attitude Towards Social Media did not show significant correlations with the main variables. Out of all socio-demographic control variables, non-partnered participants reported higher levels of Implicit Attitude Towards Social Media while Gender (female) correlated with Impulsive Social Media Use. At the same time, Chatting on Social Media Messengers and Scrolling Newsfeed were significantly positively associated with Implicit Attitude and Impulsive Social Media Use, correspondingly.

Theoretical and managerial implications of all main findings are discussed in further detail in Chapter Seven.

Chapter 7. Discussion

“It's shocking to see how bad it has been for me. However, even though I know it is bad, I know it will be really hard to take control of it”

– A participant in this study

7.1 Introduction

Chapter Seven introduces the discussion on the main findings of this research and its theoretical and managerial implications. For this, outcomes from Study One and Study Two are joined to address three objectives of the thesis:

- 1. To understand how self-control is conceptualised for the social media context in the current literature.*
- 2. To fill a theoretical gap on what constitutes excessive social media use and the impact of self-control on it*
- 3. To offer practical suggestions for users, social media site developers and public policy makers to reduce the extent of excessive use and promote positive well-being.*

All findings are discussed in relation to each objective, one by one. Also, findings are interpreted considering the main aim of this research, which was to:

Investigate the impact of self-control on the underlying mechanism of excessive social media use and personal well-being.

For this, the outcomes of the study are considered through the lens of business ethics. Beyond this, this study suggests the conceptualisation of the research design for studies measuring implicit attitudes of consumers. This conceptual approach is described as a separate section within this Chapter.

Following this, theoretical implications, contributions and research limitations are discussed. To summarise, avenues for future exploration are suggested.

7.2 The Conceptualisation of Self-control in the Social Media Context

Recent studies on self-control interventions on social media (Franks et al. 2018; Loid et al. 2020; Stieger and Lewetz 2018) demonstrate the fiasco of social media users trying to control their own behaviour. Other researchers (Sagioglou and Greitemeyer 2014; Turel and Qahri-Saremi 2016) provide evidence that social media users realise that they harm their well-being by using social media excessively; however, they cannot change their behaviour. Though having a rich heritage of acknowledged self-control theories, there is a lack of self-control frameworks for the social media context due to the novelty of the investigated environment. To address this gap, this study started from a systematic literature review which is described in Chapter Three. The current review demonstrated the lack of agreement on this area in terms of used terminology, methodology and concepts used. However, the analysis of theoretical frameworks in the chronological order provides a deeper knowledge on the evolution of self-control theories in line with the rapid development of social media. In this way, this research approaches Objective One of my thesis.

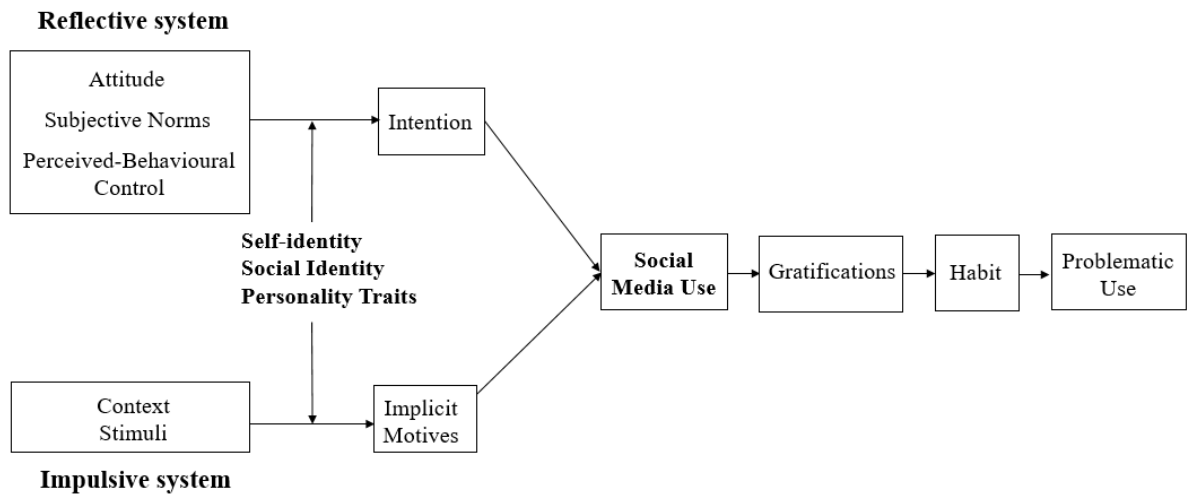
7.2.1 The Multi-Dimensional Concept of Self-control on Social Media

The current literature does not suggest a single acknowledged approach to conceptualise self-control on social media. However, it is possible to group all reviewed theoretical frameworks into four groups: theories of planned behaviour, motivation and identity theories, self-control theories and frameworks of non-planned behaviour such as dual-system theories. At the same time, the majority of selected papers draw on more than one theoretical framework. Adding to this, none of the introduced frameworks explains self-control on social media completely. Therefore, this study supports other recent claims

(Cudo et al. 2019; Du et al. 2019) about self-control being a multi-dimensional construct in this innovative domain.

The sequence of applied frameworks for social media demonstrates a gradual switch of studies from theories of planned behaviour to theories focusing on non-planned behaviour and justifying self-control failures. In spite of drawing on theories which vary in nature, almost all researchers reveal a contradiction between conscious attitudes of users and their real-life behaviour. For this reason, the prevailing number of studies interprets self-control as an imbalance between impulsive and reflective behaviour or conflict between different selves. Finally, recently academics (Baker and White 2010; Ho et al. 2017; Lee et al. 2017; Omar and Subramanian 2013; Wilcox and Stephen 2013) have highlighted the importance of personal characteristics in the exploration of excessive social media use. Considering these findings, this review attempts to aggregate them in a brief schematic representation of the current theoretical frameworks used.

As illustrated in Figure 7.2.1, this study follows the observed theoretical trend in this domain and consider the framework of two brain systems as the basis for aggregating theoretical frameworks. Then, the reflective system is represented mainly by TPB factors (Ajzen 1991) such as attitude, subjective norms and perceived-behavioural control which are exploited in studies on social media (Baker and White 2010; Ho et al. 2017; Pelling and White 2009; Polites et al. 2018). The combined effect of the main TPB factors results in a deliberate intention (Terry, Hogg, and White 1999). In contrast to it, the impulsive system is activated both by external or internal stimuli and the context or the environment on the formation of implicit motives and final behavioural response (Hagger 2013; Strack and Deutsch 2004). In this way, the dual-system approach interprets the struggle between conscious attitude, on one hand, and the impact of the environmental context and stimuli, on the other

Figure 7.2.1 Aggregated Schematic Diagram of Theoretical Frameworks

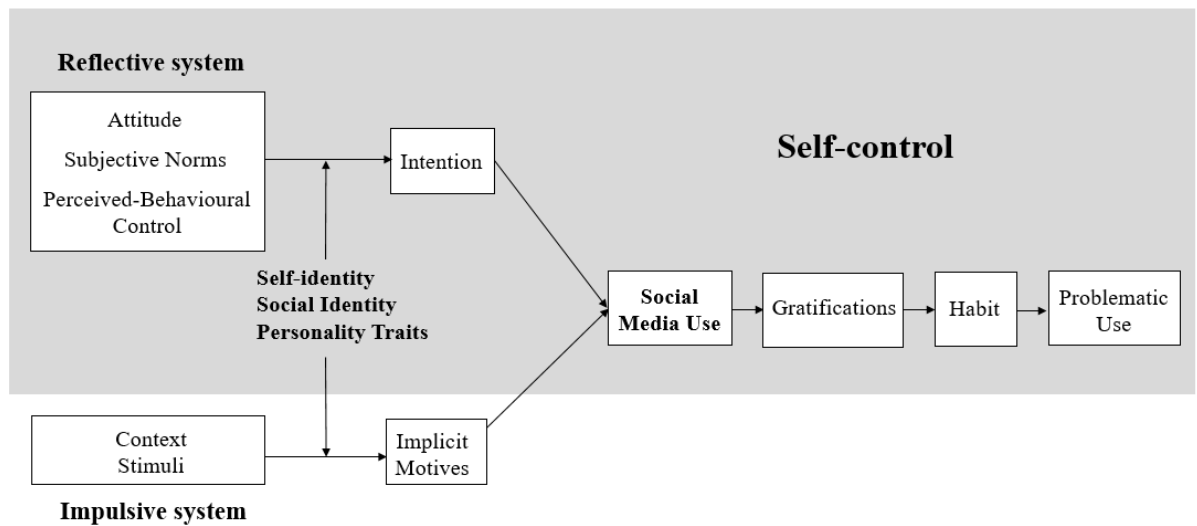
Though self-control failures are interpreted as an imbalance between two mind systems, several studies provide evidence on the impact of personality traits, self-identity and social identity theories on the extent of social media use (Baker and White 2010; Ho et al. 2017; Lee et al. 2017; Pelling and White 2009; Polites et al. 2018; Wilcox and Stephen 2013). Terry et al. (1999) explain that both constructs of social and self-identity are related to the behavioural intention. In parallel, other researchers (Rauthmann 2017; Schneider 1973) interpret automatic aspects of personality traits and call it the implicit personality theory. They explain that implicit personality traits have an impact on habitual thoughts and behaviour. For this reason, this review schematically shows self-identity, social identity and personality traits as moderators of the interaction between the reflective and impulsive system. By this, it is never claimed that this relationship is proved. However, based on the literature review I assume that the relationship between identity and final social media use is rather indirect.

Numerous studies (Cao et al. 2018; Du et al. 2019; Foroughi et al. 2019; Van Koningsbruggen et al. 2017) draw on motivation theories and on the Uses and Gratifications Framework, first of all. Meier et al. (2016a) apply the same theory to justify

habitual Facebook checking which results in procrastination or other problematic behaviours. In a similar way, social media use results in gratifications. This pathway may cause habitual behaviour which becomes problematic if not properly controlled.

Finally, findings of the literature review result in an assumption that self-control may potentially influence the final behaviour on social media within the defined area, as shown in Figure 7.2.2.

Figure 7.2.2 Aggregated Schematic Diagram. The Impact of Self-control



Initially, three main TPB factors are under the conscious control of users. This is followed by behavioural intention which managed by users too. In this case, the behaviour is defined by the reflective system and the final social media use depends on the impact of self-control on the reflective system. However, social media stimuli and the context of social media use may activate the impulsive system, where the impulsive system acts faster and may override the reflective one. Then, the final behavioural outcome is managed rather by implicit motives than by perceived behavioural control. However, even being forced by the impulsive system, social media use may still be managed by self-control and self-control interventions. For example, an impulsive response to social media cues such as mobile notifications is activated by implicit motives and can be poorly

managed consciously. Meanwhile, this may be regulated by deliberately turning notifications off or moving a smartphone away. Another example of self-control intervention could be a self-reflection on personal long-term goals. This approach may potentially transform habitual social media use to the planned behaviour and gradually impact impulsive use. However, all these assumptions require robust exploration and theoretical grounding. At the same time, this study suggests that more regular literature reviews on self-control in this domain are helpful to explore excessive use from different perspectives.

7.2.2 Study Design and Self-control Measurements

The literature review on self-control concepts in the social media context revealed one more interesting aspect of all studies. It is connected with the study designs, specifically with the samples and measurement scales used (see Table 3.4.2). The scarcity of studies in this domain makes us mindful regarding sample recruitment. The selected papers demonstrate relatively large samples from various locations with approximately half of the studies conducted on students. This trend is important considering the biggest age group of 25-34-year-olds on Facebook and Instagram (Wearesocial.com 2019). However, in several studies, there is a noticeable bias towards a larger (and disproportionate) number of women in samples which is disturbing in terms of the reliability of findings.

In terms of the research design, almost all selected papers report on quantitative research and surveys as the main technique. However, this research focuses the discussion on the measurement scales mostly. Though recent studies rely mostly on dual-system theories, the largest share of them use self-report tools only. To explore impulsive rather than deliberate behaviour, it could be worth including implicit measurements as well. This

approach may provide insufficient outputs and results in ongoing failures with self-control interventions.

From what was revealed in this review, it is suggested that the investigation of the self-control framework for the social media context is a processual step-by-step process. As studies show, it is a challenging task for researchers to conceptualise the multi-dimensional phenomenon of excessive social media use. Therefore, this method requires robust theoretical grounding for the research design and periodical review and consistent aggregation of the latest findings.

7.3 The Underlying Mechanism of Excessive Social Media Use and the Impact of Self-control on it

Drawing on dual-system theories, this research empirically investigates relationships between implicit attitudes towards social media and its excessive use. Findings of this thesis show that excessive users are guided by their implicit attitudes rather than explicit beliefs and intentions. In this way, this study conceptualises the research model as an underlying mechanism of excessive social media use. Adding to this, this work reveals the duality of self-control in the social media context which challenges the potential effectiveness of self-control for excessive social media users. This finding raises questions about ethical consumption with regard to excessive social media use and contributes to Objective Two of the study.

7.3.1 Implicit Attitude as an Antecedent in the Mechanism of Excessive Social Media Use

Why do excessive social media users continue spending so much time on social media even when it harms their well-being? Participants of this study stated: “It is something I do unconsciously and don’t think how it takes me away from the rest of my life,” or “I

should try to stay off of it, but even subconsciously I end up logging on to the sites.” There is still much to learn about what makes users dedicate more than two hours of their daily life to new technologies and sacrifice their life priorities. This underlying mechanism suppresses reflective intentions and activates fast impulsive behavioural responses which prompt ongoing social media use. Some participants stated: “It made me pause and think about what I’m actually doing on social media” or “Rather than focus on the day to come when I wake up in the morning to set goals and say affirmations, I’m checking social media”. This informs us about non-conscious impulsive and habitual behaviour rather than deliberate use.

Therefore, first, this study emphasises the role of implicit attitude as an antecedent in the mechanism of excessive social media use (see Figure 6.6.1). By this, this research contributes to recent trends to interpret self-control failures on social media as an imbalance between impulsive and reflective brain systems. Thus, future interventions to change this unhealthy behaviour should consider implicit rather than explicit attitude. Based on the findings, this work stresses the importance of the following conclusion as well. This inference suggests that including an implicit attitude measurement in the study design may reveal unexpected findings from a similar perspective. The same recommendation is proposed drawing on the results of the systematic literature review in Chapter Three.

7.3.2 The Mediating Role of Impulsive Social Media Use

Another important finding relates to the mediating role of impulsive social media use (see Table 6.6.3) Data analysis reports impulsive social media use as a strong mediator in the relationship between implicit attitude and excessive use, and for the relationships between self-control and poor well-being. Therefore, the impact of impulsive use may

potentially enforce positive implicit attitude and result in higher excessive use. However, users may hardly consciously impact their implicit attitudes (Wilson et al. 2000). Then, the relationship between implicit attitude and impulsive use may become inertial and cyclic, which is difficult to limit and stop. Further research may shed some light on the gradual enhancement of excessive social media use due to the constant interaction between implicit attitude and impulsive use. This potentially explains why excessive users logon social media every day even though they consciously realise that it results in negative outcomes. Again, participants in the study shared a similar experience, e.g.: “I feel guilty answering many of these questions” or “I find myself using social media for too long and then regretting not spending my time doing something else.”

Kahneman et al. (1973) provide the psychological interpretation of this pattern of behaviour in behavioural economics. They explain it as a natural trend for people to ignore obvious signs of regression tendencies and predict a positive outcome. More simply, people hope for something better, in spite of a previous regular bad experience, and cheat themselves. In this way, associations of the impulsive system turn into beliefs of the reflective system; or impulses turn into deliberate actions in spite of obvious negative trends (Kahneman 2011). In a similar manner, excessive social media users are guided by implicit attitudes and social media stimuli rather than by their conscious analysis and experience. This implication may help predict unhealthy social media use and, likewise, create a framework for interpreting other types of excessive screen media behaviours. Then, excessive users may attempt to reflect on the outcomes of their impulsive online behaviour and re-evaluate their expectations from the use of new technologies. This approach is discussed in further Chapter 7.6 on theoretical implications and contributions.

7.3.3 The Impact of Self-Control and its Duality

The next fundamental finding of this study pertains to the revealed duality of self-control for excessive social media users. Users with initially high levels of self-control can keep their social media use at a healthy level; however, self-control is not effective when the implicit attitude is already positive and impulsive social media use is high. Therefore, a high level of self-control is a significant indicator of healthy social media use, but it does not help heavy excessive users to manage their harmful behaviour.

This finding may become a theoretically grounded explanation for the inefficient effects of existing self-control interventions on screen media and social media. In their research, Loid et al (2020) analyse the impact of self-control smartphone pop-up notifications that aim to decrease screen time of excessive users. In contrast to their expectations, investigators report no evidence of changes in problematic smartphone use. This study suggests that self-control interventions may not be efficient when they appeal to explicit attitudes and self-control of highly impulsive and excessive users. Self-control does not moderate these relationships at this stage and behaviour stays the same. A similar experience is shared by participants of the current study, e.g.: “The survey made me think about how I started tracking my phone usage a couple of months ago and have cut it down significantly. Then this week I had three days off from school and my average daily increased by 50%.”

The duality of self-control indicates a possible distinction of excessive screen media and social media behaviours from substance and behavioural addictions. Presumably, one of the possible explanations for this self-control duality may be found in the morphological study by Turel et al. (2014). Researchers highlight an unexpected possible difference in excessive social media behaviours compared to other known addictions. Though having

a potential self-control strength to inhibit problematic use, excessive users may see no reason to change their behaviour because they are not aware of the real harm from it. In this vein, participants confessed: “My experiences taking this survey were eye opening”, “It made me pause and think about what I'm actually doing on social media”, “It's really brought to light just how much time I spend using social media daily” or “I feel like my social media usage is a way to pass the time, but that there are often better ways to pass the time”. Simply put, excessive users may experience a lack of motivation for changes in social media use. From a psychological standpoint, this behaviour may be interpreted as a possible miscoding of gains and losses (Kahneman and Tversky 2013). In this manner, for excessive users, regular reading of the latest news on social media may be perceived as a fast gain rather than being considered a loss in the long run which modifies their daily routine and damages well-being. Hence, this research claims that traditional self-control techniques that help manage other excessive behaviours, such as overeating or smoking, may not be equally effective for excessive social media use.

7.3.4 Ethical Issues of the Implicit Mechanism

The above described findings highlight the myriad ethical issues connected with non-conscious aspects of excessive social media use. Because consumers who lack self-control are guided by external stimuli rather than deliberate intentions, they may need to be protected from their impulsivity. These concerns are justified by a wide-scale experiment on 689,000 Facebook users who were successfully manipulated to change their behaviour on social media (Kramer, Guillory, and Hancock 2014). One out of two experimental groups was exposed to an increase of positive news on their Facebook newsfeed while the other group experienced an increase in negative information. This manipulation resulted in increased positive actions on social media from the first group and an increased number of negative posts from the other. The researchers call it

“emotional contagion” and claim that certain emotional states can be imposed on social media users without their knowledge. The next studies on the impact of social media comments delve deeper. Academics (Ballantine, Lin, and Veer 2015) demonstrate that the attitudes of users are even more driven by the valence of the comments than their nature. This extends the knowledge about the impact of social media on the behavioural responses of its users. Furthermore, records of personal social media profiles appear to be reliable predictors of personality traits (Kosinski, Stillwell, and Graepel 2013). Researchers are inspired by the new opportunities to adjust the design of social media to fit personal needs. At the same time, they caution that this predictability may be exploited without permission from users.

These findings are all the more disturbing when considering the impact of implicit attitudes that the current research identifies. Many participants in this study shared that this survey made them realise that they use social media impulsively and non-consciously in many cases. For example, “it was interesting to see how social media has unconsciously changed some of my habits” or “It's shocking to see how bad it has been for me. However, even though I know it is bad, I know it will be really hard to take control of it”. By saying this, excessive users admit that they may need some help to protect their well-being. Therefore, beyond testing the main hypotheses of the thesis, this study attempts to identify the most vulnerable groups of users. First, it addresses some imperfections in the sample characteristics which are revealed in the literature review for Study One. This study exploited various practices for the final sample to be close to the average social media user profile in terms of age, gender and other demographic aspects (Wearesocial.com 2019). Second, this research included and tested the possible impact of control variables, specifically demographics, time and frequency of use and social media actions, on the mechanism of excessive social media use. Data analysis reports (as

shown in Tables 6.6.7 and 6.6.8) several significant moderate and relatively strong correlations for some of them such as female gender, partnership status, time and frequency measures, chatting in messengers and scrolling the newsfeed with implicit attitudes and impulsive use. By this, this study suggests that further robust investigation needs to be undertaken to reveal the most vulnerable groups among excessive users.

This section can be completed with a disturbing confession from one of the research participants.

“I got into a bad car accident 8 months ago because I was using Instagram watching makeup videos while driving. I was on a dead road and I always drove that road surfing IG/Facebook/Snapchat. One day, I ended up swerving to avoid hitting another car and I flipped into a ditch, breaking my arm in 2 places. I'm still in physical therapy for it. I never told my friends or family how it happened and just made the excuse that an animal ran across the road causing me to crash. I'm trying to make an effort to break the habit and am very grateful I didn't die that day. Thanks for allowing me to contribute my information and share my story”.

Not all excessive social media users get in this kind of trouble because of their non-conscious impulsive behaviour. However, this work indicates that social media companies should make the ethics of consumption a priority for businesses in the digital environment.

7.4 Practical Implications

Screens are an integral part of people's daily routine. Therefore, it is important not to underestimate the benefit of applying theoretical findings in self-control interventions for

social media users. Doing so is particularly crucial when one type of excessive behaviour may diminish personal self-control and cause other addictions. However, the reverse is also true: increasing self-control in one domain improves self-control in others (Tuk, Zhang, and Sweldens 2015), which provides hope that efficient self-control techniques for excessive social media users may reduce other problematic screen media behaviours.

Therefore, this study addresses Objective Three of this study and convert findings to practical suggestions for non-academic stakeholders such as excessive users, social media marketers and public policy makers.

7.4.1 For Excessive Social Media Users

This study encourages excessive social media users to recover the balance between the two brain systems. For this, they need to decrease their impulsive behaviour, on the one hand, and increase the level of self-control, on the other. First, this research recommends decreasing the impact of implicit attitudes and minimising the number of social media stimuli to which people expose themselves. Ward et al. (2017) warn that even the presence of a device in a silent mode captures attention and decreases cognitive abilities, calling it a “brain drain.” Systematic exposure to stimuli addresses this issue and gradually changes the final behaviour (Govind et al. 2019). Excessive users may decrease the frequency of impulsive use by turning off push notifications, moving away from screens or switching them to a grayscale mode (Bowles 2018; Firat 2017; Ward et al. 2017). At the theoretical level, Duckworth et al. (2016) call it a situation-modification strategy. This strategy may become efficient when circumstances of the situation are changed on purpose to result in less impulsive behaviour similar to hiding a cake from those on a slimming diet. Following the same strategy, users may hide social media stimuli that increase the frequency of impulsive behavioural responses.

A second way for users to influence implicit attitudes is to define which social media activities take the most of their time and reduce these activities because excessive users tend to devote more time to a specific activity than to a range of them (Blinka et al. 2015). This could be a potential explanation for excessive social media use for those who are mainly involved in these specific social media activities. This study shows that chatting on messengers and scrolling newsfeeds correlate with implicit attitudes and impulsive use, respectively; therefore, excessive users can control their impulsive behaviour by limiting corresponding activities.

Regarding self-control, this study first suggests that users manage time spent on social media, which is still one of the main diagnostic criteria and ways to reduce excessive use. Although excessive social media use is not defined solely by time (Blinka et al. 2015; Pontes et al. 2015b; Young 2009), time measures are still one of the main criteria to diagnose and reduce this unhealthy behaviour. The same is reported by the test of control variables in the current study. Time and frequency have a significant moderately strong correlation with excessive and impulsive use, correspondingly. Second, excessive users could apply techniques from cognitive behavioural therapy, which have proved effective for gambling, substance abuse and Internet use, though these techniques have a rather complex daily program (Liu and Potenza 2010; Young 2009). For a simpler start, it is suggested using a prevention-focused technique (Sengupta and Zhou 2007), reflecting on life priorities and daily plans before logging in to social media, which can help keep people's values at the forefront. When answering questions for this survey, participants realised how much time they spend on social media "without thinking" or "instead of spending it with a family, friends and pets". To address this, this research recommend that they reflect on their priorities before using social media.

Finally, this thesis follows other academics (Turel and Qahri-Saremi 2016) in their claim that the responsibility to increase personal self-control lies not only with social media companies but also with social media users themselves, just as, for example, those addicted to alcohol drink less when they attempt to control their behaviour on their own (Collins, George, and Lapp 1989). Therefore, this study suggests that excessive users mindfully estimate the long-term outcomes of their excessive behaviour, try to cope with impulsive temptations and exercise their willpower.

7.4.2 For Social Media Marketers

The innovative advantages of social media are impressive and not doubtful. Meanwhile, a battery of research papers (Cudo et al. 2019; Delaney et al. 2018; Du et al. 2019; Turel and Bechara 2016) reveals negative consequences of impulsive social media use. Researchers from various research fields urge the protection of vulnerable consumers from their impulsive behaviour (Verplanken and Sato 2011). The dilemma of self-regulation versus regulation of consumers relates to business ethics and can hardly be ignored by massive scale businesses. McMurrian and Matulich (2016) explain two straightforward reasons for businesses to be worried about following business ethics nowadays. The first reason relates to policy interventions by governments while the second is based on the trust of consumers. Therefore, this study calls on social media marketers and businesses to use findings of this work to support their consumers by protecting them from their impulsivity.

First, in line with dual-system theories, the fastest way to do this is to limit social media stimuli, which are active by default. Second, being armed with advanced technological facilities, marketers could raise excessive users' awareness of how they spend their online time by displaying personal statistics of social media use in an easy-to-see way. Existing

self-regulation techniques are not efficient yet (Loid et al. 2020), so traditional self-control reminders and time planners should be redesigned to be consistent with researchers' conclusions. As it is shown on the aggregated diagram from the literature review (Figure 7.2.1), regular impulsive consumption may turn into habits and lead to a deterioration of personal self-control in the long run (Kim and Choi 2007). Therefore, marketers need to consider including "human elements" in their strategies which is highly relevant for the social media context (de Vries, Veer, and de Vries 2018).

Confirming these concerns, former Facebook leaders (Solon 2017; Wang 2017) assert that social media exploits users' psychological vulnerabilities to create addictive behaviours. They admit that site developers do not fully understand all the possible consequences of the non-conscious behaviour this encourages. To avoid similar criticism, marketers need to support governmental or research undertakings on self-control and motivate users to reflect on their daily social media use. Joining academic and industry efforts may result in a mutually beneficial situation in which social media considers ethical aspects of excessive use and boosts users' well-being.

7.4.3 For Public Policy Makers

From a public policy standpoint, this research provides disturbing evidence of non-conscious online behaviour, which can become a theoretical rationale for implementing new public practices. In this regard, this study supports other researchers (Mai et al. 2017) in their claim that nowadays a deeper knowledge of implicit consumption processes is essential for businesses and policy makers. The evidence of non-conscious online behaviour in this investigation provides a theoretical rationale to protect users from their impulsivity and implement new public practices.

First, public policy officials may enforce limitations on social media stimuli to lessen the impact of positive implicit attitudes. The same approach has already been discussed for other excessive behaviours. In this vein, studies on behavioural economics (Gathergood 2012) claim that consumers who suffer from over-indebtedness may only benefit from lower access to credit resources (Gathergood 2012). In this regard, it is especially important to observe adolescents, whose brains have fewer neurobiological abilities to resist temptations and strong desires (Volkow et al. 2016). Therefore, governmental officials may find it reasonable to provide social media companies with clear guidance on ethical business approaches.

Regarding self-control practices, public institutions need to raise awareness of the problematic behaviour and its ethical issues. One can hardly doubt that to address any issues in daily life, it is important to become aware of them. Responses in this study show that most of the participants had not reflected on how excessive social media use harms their well-being. They shared that, only after this survey, they realised how social media interferes in their daily life and how much they use it “subconsciously” and “without thinking”. This can be addressed through educational courses or separate disciplines in curricula on overall digital literacy.

The second suggestion involves the long-term role of public officials in increasing personal individuals’ and communities’ self-control and welfare. If self-control issues are not addressed through training early on, these issues can progress with age, and innocent preferences of young people could become reliable antecedents of problems with self-control in adulthood (Meier et al. 2016b; Robertson et al. 2015). A unique Dunedin study (Poulton 2019) explored the various changes in behaviour and the physical state of 1,000 participants born in 1972 over a span of 40 years. The latest regular assessment at age 38 resulted in a number of publications across multiple disciplines. For example, the

researchers monitored substance and smoking dependence of the cohort at regular intervals from 21 to 38 years old (Meier et al. 2016b; Robertson et al. 2015). The authors claim that low childhood self-control and low-frequency smoking as young adults are accurate predictors of persistent substance dependence in adulthood. They explain that many low-frequency smokers define themselves as non-smokers, though these smokers are at high risk of becoming highly addicted to smoking in the long term. Moreover, the desire to get rid of unhealthy behaviour decreases as substance use increases. In terms of practical implications, this suggests a change in approach, as public policy officials need to focus on both high-frequency and low-frequency drug users because there is no safe frequency of substance use. This logic suggests that public policies should focus on both high- and low-frequency users by holding education programmes on self-control, which may further expand to other domains relating to similar issues (Tuk et al. 2015). The same aim can be addressed through social media communities or online social groups which have shown their efficiency in decreasing excessive behaviours and protecting vulnerable groups of consumers (Ballantine and Stephenson 2011; Parkinson, Schuster, Mulcahy, and Taiminen 2017).

Third, this study advocates for social control in the social media context. Excessive users may be partly protected from their impulsive behaviour by the social bonds and efforts of social network members, in both real and online life (Lewis and Rook 1999; Taylor 2001). Definitions of social media and social control sound alike not accidentally but because of the role of the community in both. Then, the communities themselves could take care of their most vulnerable members and groups. Researchers (Hirschi 1969; Lewis and Rook 1999; Taylor 2001) define social control as social bonds that include regulation, influence and, certainly, constraints on the final behavioural response. Also, social control is a predictor of wellbeing-enhancing behaviour, especially for adolescents

(Gunuc and Dogan 2013). However, it is also often associated with the psychological distress of constraints (Lewis and Rook 1999). To address this, informal social control may be initiated by a person's closest circle of family or friends (Gunuc and Dogan 2013; Rice and Hagen 2010). However, the perspectives of social control in the digitalised society have not been fully investigated. This research suggests that public officials lead this movement and bridge the community with all groups of stakeholders.

Last but not least importantly, public authorities should invest in multidisciplinary research programmes to provide deeper knowledge of excessive screen media use and test innovative self-control techniques. The exponential growth of new technologies requires a rapid parallel exploration of their consequences for users. To achieve this, government institutions may consolidate their efforts with the knowledge of researchers and the advanced facilities of social media businesses. In summary, this study emphasises that the ethics of consumption should become an integral part of public policy involving social media and other screen media.

To summarize, all practical recommendations, their desired outcomes and potential challenges for non-academic stakeholders are described in Table 7.4.3.

Table 7.4.3 Practical Recommendations for Non-Academic Stakeholders

Group of Stakeholders	Aim of the Recommendation	Practical Recommendations	Desired Outcome	Potential Challenges
Excessive Social Media Users	Decreasing the impact of social media stimuli	To minimize the presence of social media stimuli. For example, to turn off default push notifications, move devices away in terms of physical distance, switching a greyscale mode.	Decreasing impulsive social media use.	Social pressure to get back to regular use of social media and accessibility.
	Decreasing time spent on social media	To identify a primary social media activity, i.e. chatting on messengers or scrolling the newsfeed, which takes the most of the time and to reduce its use To install time measuring applications and analyse time which is spent on social media daily	Spending less daily time on social media	Challenges of changing a habitual pattern of online behaviour and attempts to switch to the same activity on another platform In practice, statistics of time measuring applications are analysed after social media use. This decreases the potential efficiency of this approach when users are guided by implicit and impulsive behavioural responses
		To analyse personal daily social media use by answering questions of surveys on excessive social media use	Reflecting on the extent of social media impact on daily life and personal behavioural online patterns	Providing socially desirable answers and perceiving social media as an appropriate alternative to offline communication
	Increasing mindfulness and self-control when using social media	To apply techniques from cognitive behavioural therapy such as a prevention-focused technique (Sengupta and Zhou 2007) and reflect in life values and priorities before logging on	Changing the quality of time which is spent on social media and keep the balance between offline priorities and online social communities	Social Pressure to get back to regular use and underestimating the value of offline communication

		To interview the closest circle of friends and families on their opinion about an individual's social media use	Looking on the personal online behavioural patterns through the eyes of the closest people around	A differentiated and biased attitude to personal opinions of people from groups with the other social status, age, occupations etc.
Social Media Marketers	Decreasing impact on implicit attitudes of the most vulnerable users	To limit the number of social media stimuli such as push notifications which are activated by default	Decreasing the number of impulsive logons	Technical support of requests and questions from users
	Increasing awareness of users about the quality of time spent on social media	To design and provide users with the time planners and offline agenda reminders which can be integrated into the social media interface.	Increasing planned social media use	Development and integration of additional applications in cooperation with the researchers
	Increasing the overall level of self-control among social media users	To develop and introduce a wide-scale multichannel social campaign aimed to decrease impulsive social media use which results in mental and physical harm. This campaign may potentially be based on real life stories to appeal to different target groups of users	Increasing understanding of the importance of self-control when using social media within the community	High level of investment and support of the long-term run initiative
Public Policy Makers	Protecting users from their impulsive use	To enforce limiting default social media stimuli especially for adolescents	Decreasing impact of implicit attitudes and frequency of impulsive use	Challenges of negotiating with social media companies which can be counteracting with their financial goals
	Increasing level of personal self-control for social media users	To introduce public policy guidelines for social media companies to include key ethical concerns on non-conscious and impulsive social media use	Decreasing potentially harmful social media stimuli and functionality which enforces excessive social media use and poor well-being	Development and approval of business ethics guideline for social media companies at the governmental level
	Protecting the most vulnerable age groups of users	To develop and conduct long-term educational campaigns aimed to increase the level of self-control in the online environment. These programs need to target high schools and tertiary educational institutions, first of all. Courses on self-control in the	Increasing the level of self-control for young users and decreasing risks of multiple excessive behaviours	High level of long-term investment and lack of fast results

	online environment need to provide a deeper reflection on social media use and recommendations on how to manage it in a healthy way. These courses can be included as mandatory in the education curriculum.		
Enhancing social control to decrease unhealthy social media use	To introduce possible ways to decrease excessive social media use by drawing on the informal support of the closest circle of family and friends and encouraging socializing in real life. Social control interventions may include scheduled regular real life gatherings, joint discussion of alternative hobbies and entertaining etc.	Increasing offline socializing and improving a balance between social media use and real life communication	Perceiving of social control as an unnecessary additional control and, therefore, underestimating of its efficiency by excessive social media users
Preventing excessive social media use and other excessive online behaviours	To introduce national-wide programs on increasing self-control for high and low-frequency social media users and diverse online activities.	Protecting low-level social media users from excessive online behaviour in future	Common wide-spread scepticism on teaching self-control on using innovative technologies
Providing deeper knowledge on antecedents and possible interventions for excessive social media users	To support and encourage multidisciplinary studies on excessive online behaviours	Joining efforts of researchers from various research domains and countries in exploring ways to boost self-control in online activities	Integrating interests of public policy makers in the research flow of highly-experienced academics

7.5 Methodological Contributions: the IAT Placement in Research Design

With regards to contributions to methodology, this research employed the use of an IAT measure to avoid the inherent biases associated with self-report methods in stigmatised contexts. First introduced by Greenwald et al. (1998), the IAT is considered to be one of the most prominent and widely used measures of implicit attitudes, specifically in consumer research (Frieze and Hofmann 2009; Gattol, Sääksjärvi, and Carbon 2011; Maison, Greenwald, and Bruin 2004; Pogacar, Carpenter, Shenk, and Kouril 2019). The IAT measurement of implicit attitudes and its impact on consumption behaviour is increasing its contribution to marketing by interpreting impulsive consumer decisions which is demonstrated in various studies (Govind et al. 2019; Lannoy et al. 2020; Lindgren et al. 2014; Mai et al. 2017; Maison et al. 2001; Mattavelli et al. 2017). However, despite gaining prominence in marketing studies, little is known about how best to utilise the IAT, especially in a social media context. The current study highlights the importance of a thoughtful research design when including implicit measures and, therefore, provides a literature driven conceptualisation of incorporating the IAT in a research methodology.

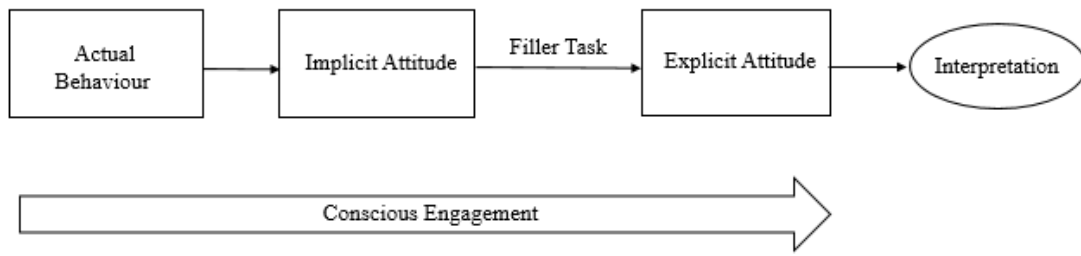
Several researchers stress the importance of the proper placement of the implicit attitude measure in the methodology and research process. Rydell and McConnell (2006) emphasise an interplay between implicit and explicit attitudes. Academics provide evidence that implicit attitudes are changed when participants of studies are presented new counter attitudinal information which is sufficiently remarkable for them. In parallel, Steffens & Buchner (2003) explain that measuring implicit attitude is sensitive to situational variations. For example, implicit attitude towards elderly people is more positive when new “good and elderly” associations are introduced to study participants before the test (Karpinski and Hilton 2001). The same trend is observed when exploring

the attitude to weak and strong women (Blair, Ma, and Lenton 2001) or European over African American people (Dasgupta and Greenwald 2001).

In the same way, Steffens & Buchner (2003) experimented by introducing the measurement of explicit attitudes first and suggest that measures of explicit attitudes have carry-over effects on measuring implicit attitudes. Schmukle and Egloff (2005) confirm the same concern and highlight that implicit attitudes are less subject to conscious engagement. Therefore, the findings of IAT-based research are less biased if implicit attitudes are measured first. At the same time, several experimental studies change the sequence of measures according to the nature and main aims of the research. For example, Govind et al. (2019) measured explicit before implicit attitudes and the actual brand preference at the end. Researchers explain this sequence by focusing on the impact of an intervention on the final actual choice of participants.

In this way, the current literature provides detailed discussions on the results of the IAT use. However, the conceptualisation of the IAT-based research design has been neglected to date. This gap in understanding may potentially explain the scarce literature reviews on measuring the implicit attitudes of consumers. It would be challenging to synthesise these types of studies due to an inconsistency in the sequence of measures. Based on findings from this study, it is suggested that IAT studies in consumer research need to be guided by a specific research design unless another sequence is dictated by the nature and aims of the investigation. The sequential blocks of measurements are shown in Figure 7.5.1.

Figure 7.5.1 The Sequence of Measures in the IAT-based Research Design



This work follows Schmukle et al. (2005) who claimed that the data on implicit and explicit attitudes is different from the perspective of the conscious engagement of participants and, therefore, needs to be measured in a certain order to avoid carry-over effects. For this, the actual behaviour is measured at the beginning of the study because of two main reasons. First, participants are not yet aware of further survey items. Therefore, their responses represent their usual pattern of behaviour in a way which is closest to real life. Second, measuring actual behaviour, either product consumption or consumption activity, from the start, becomes a qualification criterion for the participants of the study. Then, qualified participants are invited to complete measures of implicit attitude as the second stage. In this way, studies avoid possible biases of implicit attitudes caused by the self-reflections of participants in the given research. Measuring implicit attitudes is followed by items on explicit attitudes as it is suggested by many other researchers (Mattavelli et al. 2017; Schmukle and Egloff 2005). However, to strengthen the credibility of explicit measurements, this study draws on the recommendations of Podsakoff et al. (2003) on how to decrease potential common method bias. For this, filler tasks are incorporated as a methodological and psychological separation between measures of implicit and explicit attitudes. Considering the increasing use of measuring implicit attitudes, participants of any study may be aware of the main aim of interactive tasks measuring implicit attitude. Then, researchers need to ensure that respondents are distracted from implicit measurements before reporting on their explicit attitudes. Lastly,

the collected data is interpreted and discussed taking into account the other control variables involved.

As shown in Figure 7.5.1, the presented sequence of measures follows an increase in the conscious engagement which is required from participants at different stages of an IAT-based study. In the beginning, participants report their usual pattern of behaviour not considering any other items of the study yet. Then, they complete the test on their implicit attitude. This test requires the use of personal cognitive efforts, however, the main aim of the test is not obvious for non-researchers. After measures on the implicit attitudes, researchers introduce filler tasks to avoid the impact of possible carry-over effects. Many known tests of implicit attitudes include the evaluation of fast behavioural reactions, therefore, participants need to have a relaxing break to proceed with further questions. Finally, the highest level of conscious engagement is required by the last block of measures to explore the explicit attitudes of participants.

Results of the current study justified the credibility and cost-efficiency of the introduced sequence of measures. In the first stage, the respondents were qualified for the main study by answering questions about their general social media use. This ensured that self-reported social media use is not biased by a feeling of guilt after answering questions about the impact of use on personal well-being. Qualified participants were invited to complete the SC-IAT. Then, the attention of respondents was distracted by the filler tasks. The effectiveness of this approach was justified by the final feedback of the respondents. The measures on the explicit attitudes ended the survey. At the end of this study, many participants reported that they did not think about the harm of social media use in their daily life before. Therefore, the last block of measures became an intervention for most of the respondents. This allows us to emphasise the importance of placing self-reported items on explicit attitudes at the end of a study. From what is known from the current

literature, the introduced sequence of measures may be changed only for the intentional impact on implicit attitudes. This intention relates to studies when it is required to evaluate the impact of self-reflection on implicit attitudes. However, this alternative approach needs to be justified by the objectives of a study and the pragmatic considerations of researchers.

This work suggests that the same study design may be used to explore the change of implicit and explicit attitudes over time. However, this suggestion needs to be tested in longitudinal studies which is a research avenue for future exploration.

7.6 Theoretical Implications and Contributions

The results of this study point to at least several major theoretical implications and contributions.

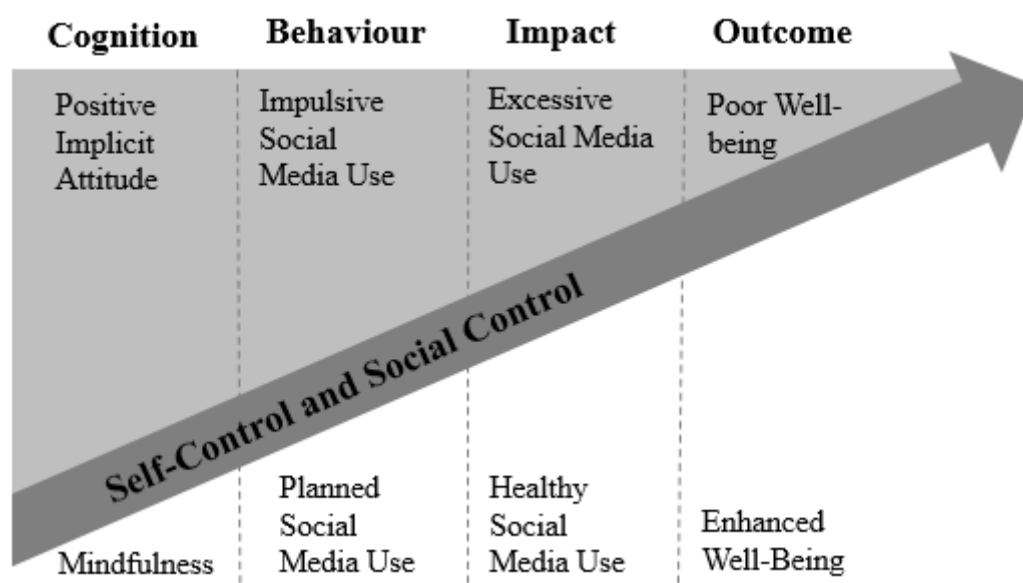
First, this research provides a review of the current literature on self-control theories in the social media context. The current study attempted to provide an aggregated schematic diagram joining core theoretical frameworks based on dual-system theories. The existing studies attempt either to apply acknowledged concepts or adapt them for this new domain. However, the review did not reveal any study which would provide the complete interpretation of self-control mechanisms with regard to social media. This work joins claims of other investigators that self-control is a multi-dimensional construct which needs to be interpreted for social media rather than a separate theoretical construct. Meanwhile, this investigation demonstrates the trend towards moving from theories of planned behaviour to frameworks explaining self-control failures. In this way, the current synthesis of relevant papers may explain reported failures of self-control interventions and provide research avenues to find a way for excessive users to control their daily behaviour.

Second, this research expands the existing knowledge on antecedents of impulsive and excessive social media use. This study explores possible reasons for inconsistency between the human ability to control behaviour and excessive social media use with its disturbing consequences for personal well-being. Based on the findings of the systematic literature review in Study One, the underlying mechanism of excessive social media use is conceptualised from both theoretical and empirical perspectives, adding to the body of knowledge on dual-system theories. This study supplements traditional self-report methodologies by combining implicit and explicit measures. In doing so, this thesis contributes to the definition and diagnosis of excessive social media use.

Third, this work provides evidence of the duality of self-control in managing this type of unhealthy behaviour. This knowledge interprets the inefficiency of existing self-control techniques and becomes a theoretical grounding for future interventions. It points to a proper disposition for current self-control interventions and provides new suggestions on how to increase self-control and boost users' well-being. This discussion results in a schematic framework of the role of self-control and social control in balancing social media use as depicted in Figure 7.6.1. This conceptual framework describes four phases of excessive social media use such as cognition, behaviour, impact and outcome which follow one another. In the mechanism of social media use, a cognition phase is assigned to positive implicit attitude which is followed by impulsive use as a behaviour phase. Then, the impact is defined as excessive social media use while poor well-being relates to an outcome. In the meantime, this study is guided by the TCR framework which aims to transform consumer behaviour for the good of consumers. In this vein, figure 7.6.1 shows that excessive social media use is lower when an individual's self-control and social control are high. At the same time, high self-control relates to healthy social media use. Therefore, this work suggests that time on social media may stay the same while

self-control may potentially transform unhealthy social media use and restore a healthy balance in this type of screen media behaviour. However, this transformation of users' behaviour is possible with the proper disposition of self-control interventions and techniques.

Figure 7.6.1 Four Phases Model of Excessive Social Media Use.



Fourth, understanding excessive social media use from the perspective of the two brain systems involved may become a framework for interpreting and predicting other screen media behaviours. This approach may be helpful in introducing the conceptual framework to justify multiple excessive behaviours which are revealed in the literature review of this thesis. The similar theoretical perspective may reveal more dimensions of the ambivalence of attitudes which is common for known excessive behaviours. Fifth, the current thesis follows the multi-paradigmatic TCR framework and place users at the centre of the research. Therefore, conclusions of this study provide practical implications for non-academic stakeholders, such as excessive social media users, social media site marketers, and public policy makers. These recommendations are mainly related to implicit attitudes, self-control and ethical issues.

Finally, Maxwell (2013) emphasises that acquiring pure knowledge about technological innovations is just a preparatory step for a further transformation of this expertise to wisdom and understanding of how it fits into life values for oneself and others. With that in mind, this exploration aims to contribute to the multi-disciplinary TCR framework – specifically, a separate domain of digital TCR that focuses on consumers’ well-being and the ethics of consumption.

Overall, this thesis represents another step towards understanding whether the same tool that has been linked to a lack of self-control and negative outcomes for mental health can subsequently be used to encourage, rather than harm, positive personal well-being.

7.7 Research Limitations

7.7.1 Research Limitations of Study One

This review is mainly limited by the quantitative nature of the prevailing part of selected papers which may omit important insights and feelings of excessive social media users related to problems with self-control. The second limitation is using only five terms for “social media”. Further reviews may consider an extended list of words including “social network”, “online community”, “online group” and others and explore the conceptualisation of self-control for a wider variety of social media platforms. The next limitation is that almost all the participants were mainly Facebook users. This restricts an understanding of issues connected with managing personal behaviour on various social media platforms. The fourth limitation relates to a single screening for study selection in this systematic review. It was done as the sole responsibility of a PhD candidate for this thesis and can be considered as a significant limitation of this study. Fifth, this review revealed relevant papers published within ten latest years and, therefore, may potentially describe limited evolution. Further reviews need to be made to explore the same research

domain with a bigger number of inclusion criteria. Finally, this review could be extended by considering self-control concepts for desktop and smartphone use as separate domains. Technically, social media accounts are similar on all devices. However, patterns of impulsive behaviour can differ to a great extent.

7.7.2 Research Limitations of Study Two

Several limitations of this study must be noted. First, the interpretation of findings is limited by sample size. Although the size exceeded SEM-PLS requirements for a minimum sample, it was still not large enough for generalisation. However, the exploratory nature of the current exploration, which required the identification of relationships before replicating it on a wider scale, justified not using a sample large enough to allow for generalisability. Second, the recruited sample is skewed towards respondents with employment, either full or part-time, and a university degree. This need to be considered when evaluating the findings of this survey. Third, this study incorporated filler tasks aimed at controlling sources of common method variance rather than to compare experiences between different periods; however, this research provides a basis for future longitudinal studies to justify causal relationships. Fourth, this research recommends using caution in interpreting the results with self-report measures in terms of the duration of social media use. Participants were asked to identify a range of time durations or frequencies in their responses; however, time measurements can hardly be precisely estimated by study participants. Fifth, this research design includes a limited number of social media use parameters as control variables. Nonetheless, it provides a reliable starting point for further exploration.

7.8 Avenues for Future Research

In light of the limitations, this study outlines avenues for future exploration. First, this study claims an urgent need for further investigation and synthesis of what is known about self-control theories on social media from various perspectives. Without the theoretical conceptualisation, occasionally successful self-control interventions may not have a chance to be replicated on larger samples. Second, it would be appropriate to consider replication of a similar research design to Study Two on a larger scale to explore the possible generalisation of the theoretical construct.

My third suggestion follows the claims of other researchers (Blinka et al. 2015; Punj and Stewart 1983; Rundle-Thiele, Kubacki, Tkaczynski, and Parkinson 2015) on the importance of defining meaningful homogeneous segments of consumers, particularly for social marketing. Being joined by similar characteristics, separate segments of social media users may have different predictors and risk factors for their excessive use. With regard to the methodology, two-step cluster analysis can be exploited to reveal if excessive users can be joined in segments based on their implicit attitudes or impulsive social media use. Then, researchers may explore the sociodemographic profile of each segment and target them with different self-control interventions appropriately. However, segmentation is not outlined by the research questions for this study and, therefore, it needs to be explored as another study in the future.

Fourth, future studies would likely benefit from considering an extended methodology in consumer research on social media users. To explore excessive behaviours, researchers may include measures of implicit attitudes as another dimension of human attitudes. By focusing on self-report measurements only, investigators risk underestimating the predictive power of implicit attitude and impulsive behavioural response. To overcome

this gap, the current thesis provides the conceptualisation of the research design measuring implicit attitudes in consumer research. Another suggestion is to employ longitudinal and experimental studies with specific design strategies informed by the results of this investigation. Beyond this, for the sake of the accuracy, this study recommends adding precise time measurements to implicit and self-reporting measures. In parallel, researchers could explore the difference between a personal understanding of the time spent on social media and actual measurements.

The fifth suggestion includes several recommendations on the exploration of the wider context. For example, future research could explore distinctions in impulsive use more deeply, differentiating technical methods (e.g. desktop, smartphone, tablets), diverse social media sites with different functions as the main focus and specific social media activities such as texting, scrolling newsfeed, “liking” and so on. These aspects may distinguish social media use from other types of excessive screen media behaviours. Future research could also concentrate on the range of stimuli, such as push notifications, that can result in excessive social media use. This investigation could result in a typology of stimuli identifying their extent and impact on social media use. Adding to this, this research suggests extrapolating findings on implicit attitudes to other screen media activities such as online gaming as one of many risk factors in developing addictive online behaviours (Blinka et al. 2015).

As a sixth suggestion, this study encourages the involvement of other research fields to explore this topic because studying human behaviour inevitably requires a multi-disciplinary approach. For example, Mishra and Mishra (2010) conclude that it is possible to decrease impulsive consumption by increasing serotonin levels in the human body. Other researchers (He et al. 2017) demonstrate impressive findings that excessive social

media use is associated with brain alterations. The results of studies in non-marketing areas may shed light on various aspects of unhealthy online behaviour.

The quintessence of all described study directions is the need to further explore the duality of self-control. This research suggests other researchers to join the discussion on whether excessive users need to be protected from their impulsive behaviour or they need to be armed with robust motivation and start controlling their use on their own.

Finally, this work encourages the involvement of other research fields in further exploration. Study of human behaviour inevitably requires a multi-disciplinary approach, including consumer behaviour, psychology, sociology, environmental sciences, neurobiology, morphology, business ethics and so on. All these standpoints will make it possible to connect various perspectives to shed light on the process of defining innovative and efficient self-control techniques.

Chapter 8. Conclusions

“Practical wisdom is essential for orchestrating the other virtues into an effective, moral, and happy life”

– Mick et al. (2011, p. 665)

This investigation interprets excessive social media use from the multi-paradigmatic perspective of the TCR framework. For this, the current work places social media users at the centre of the research and explore possible ways to enhance their well-being.

In Study One, this manuscript introduces the first known attempt to synthesise current conceptualisations of self-control in the social media context. The chronological analysis of theoretical frameworks shows the gradual switch from theories of planned behaviour to theories explaining self-control failures. This shows the multi-dimensional nature of the self-control construct in this domain and explains why there is no single self-control theory with regard to social media yet. However, the rapid distribution of social media results in both positive and negative consequences for users' well-being. In this regard, the urgent need for the conceptualisation of the underlying mechanism for both excessive social media use and self-control is highlighted.

Study Two addresses a part of revealed concerns. Drawing on dual-system theories, this research conceptualises excessive social media use as an imbalance between impulsive and reflective brain systems. This underlying mechanism suppresses deliberate intentions and enhances fast impulsive behavioural responses, which prompt ongoing social media use. This investigation interprets excessive social media use from the perspective of dual-system theories and the nature of other known excessive behaviours. In the study design, implicit and explicit measurements are combined to reveal the underlying mechanism of excessive social media use and its antecedents. In doing so, this study specifically highlights the role of implicit attitude as a predictor of impulsive and excessive social media use. Findings of this work justify an extended methodological approach that adds implicit measurements to the self-reports of consumers. Adding to this, this work conceptualises the research design for studies measuring implicit attitudes in consumer

behaviour. Therefore, the specific sequence of measures is suggested for the consideration of investigators.

Notably, this research demonstrates a certain duality of self-control. While self-control is a significant indicator of healthy social media use, it is not helpful for excessive users with a positive implicit attitude and high impulsive use. This thesis provides a theoretically grounded explanation for the inefficiency of existing self-control techniques. At the same time, the outputs of this investigation reveal new perspectives on possible ways to control this type of excessive behaviour. The current study ultimately raises more questions than answers, foremost of which is the ethics of consumption, which is supposed to be a free and conscious personal choice. Despite its many advantages, social media may result in negative outcomes for users' daily lives if used excessively. Paraphrasing Wiener (1954), it is not innovations themselves that are dangerous for people, but what people make of them. From this standpoint, this study employs theories of behaviour change to find a way for the same tool that has been linked to negative consequences and lack of self-control to boost well-being rather than harm it.

References

- Aalbers, George, Richard J McNally, Alexandre Heeren, Sanne de Wit, and Eiko I Fried. 2019. Social media and depression symptoms: A network perspective. *Journal of Experimental Psychology: General*, 148(8), 1454.
- Aboujaoude, Elias. 2010. Problematic Internet Use: an Overview. *World Psychiatry*, 9(2), 85-90.
- Abrams, Dominic, and Michael A Hogg. 1990. Social identification, self-categorization and social influence. *European Review of Social Psychology*, 1(1), 195-228.
- Ackard, Diann M, Dianne Neumark-Sztainer, Mary Story, and Cheryl Perry. 2003. Overeating among adolescents: prevalence and associations with weight-related characteristics and psychological health. *Pediatrics*, 111(1), 67-74.
- Ajzen, H, and Martin Fishbein. 1980. *Understanding Attitudes and Predicting Social Behavior*. Englewood Cliffs, N.J.: Prentice-Hall.
- Ajzen, Icek. 1991. The theory of planned behavior. *Organizational Behavior and Human Decision Processes*, 50(2), 179-211.
- Aliyu, Aliyu Ahmad, Muhammad Umar Bello, Rozilah Kasim, and David Martin. 2014. Positivist and non-positivist paradigm in social science research: Conflicting paradigms or perfect partners. *J. Mgmt. & Sustainability*, 4, 79.
- Anderson, Emma Louise, Eloisa Steen, and Vasileios Stavropoulos. 2017. Internet Use and Problematic Internet Use: A Systematic Review of Longitudinal Research Trends in Adolescence and Emergent Adulthood. *International Journal of Adolescence and Youth*, 22(4), 430-454.
- Anderson, Laurel, Amy L. Ostrom, Canan Corus, Raymond P. Fisk, Andrew S. Gallan, Mario Giraldo et al. 2013. Transformative service research: An agenda for the

References

- future. *Journal of Business Research*, 66(8), 1203-1210. doi: 10.1016/j.jbusres.2012.08.013
- Andreassen, Cecilie Schou. 2015. Online social network site addiction: A comprehensive review. *Current Addiction Reports*, 2(2), 175-184.
- Andreassen, Cecilie Schou, Joël Billieux, Mark D Griffiths, Daria J Kuss, Zsolt Demetrovics, Elvis Mazzoni et al. 2016. The relationship between addictive use of social media and video games and symptoms of psychiatric disorders: A large-scale cross-sectional study. *Psychology of Addictive Behaviors*, 30(2), 252.
- Andreassen, Cecilie Schou, Torbjørn Torsheim, Geir Scott Brunborg, and Ståle Pallesen. 2012. Development of a Facebook Addiction Scale. *Psychological Reports*, 110(2), 501-517.
- Andrews, Sally, David A Ellis, Heather Shaw, and Lukasz Piwek. 2015. Beyond self-report: tools to compare estimated and real-world smartphone use. *PloS One*, 10(10).
- Aragoncillo, Laura, and Carlos Orus. 2018. Impulse buying behaviour: an online-offline comparative and the impact of social media. *Spanish Journal of Marketing-ESIC*, 22(1), 42-62.
- aria.stats.govt.nz. 2019. Age - New Zealand Standard Classification V1.0.0. <http://aria.stats.govt.nz/aria/#ClassificationView:uri=http://stats.govt.nz/cms/ClassificationVersion/CARS153>
- Armijo-Olivo, Susan, Carla R Stiles, Neil A Hagen, Patricia D Biondo, and Greta G Cummings. 2012. Assessment of study quality for systematic reviews: a comparison of the Cochrane Collaboration Risk of Bias Tool and the Effective Public Health Practice Project Quality Assessment Tool: methodological research. *Journal of evaluation in clinical practice*, 18(1), 12-18.

References

- Association, American Psychiatric. 2013. *Diagnostic and Statistical Manual of Mental Disorders (DSM-5)*: American Psychiatric Pub.
- Assunção, Raquel S, and Paula Mena Matos. 2017. The generalized problematic internet use scale 2: validation and test of the model to Facebook use. *Journal of Adolescence*, 54, 51-59.
- Ayar, Dijle, Murat Bektas, Ilknur Bektas, Asli Akdeniz Kudubes, Yasemin Selekoglu Ok, Sema Sal Altan et al. 2017. The effect of adolescents' internet addiction on smartphone addiction. *Journal of Addictions Nursing*, 28(4), 210-214.
- Bacon, S.D. 1976. *Concepts: Alcohol and alcoholic problems: New thinking and new directions* Cambridge: Ballinger Publishing.
- Bagozzi, Richard P. 1992. The self-regulation of attitudes, intentions, and behavior. *Social Psychology Quarterly*, 178-204.
- Bai, M. Hui. 2018a. *Evidence that A Large Amount of Low Quality Responses on MTurk Can Be Detected with Repeated GPS Coordinates*.
<https://www.maxhuibai.com/blog/evidence-that-responses-from-repeating-gps-are-random>
- Bai, M. Hui. 2018b. *A Proposed Procedure for Testing the Evidentiary Value of Responses from Duplicated GPS Sources*. <https://www.maxhuibai.com/blog/a-proposed-procedure-for-testing-the-evidentiary-value-of-responses-from-duplicated-gps-sources-comments-invited>
- Bak-Sosnowska, Monika. 2017. Differential criteria for binge eating disorder and food addiction in the context of causes and treatment of obesity. *Psychiatr Pol.[Internet]*, 51(2), 247-259.
- Baker, Monya. 2016. Statisticians issue warning over misuse of P values. *Nature News*, 531(7593), 151.

References

- Baker, Rosland K, and Katherine M White. 2010. Predicting adolescents' use of social networking sites from an extended theory of planned behaviour perspective. *Computers in Human Behavior*, 26(6), 1591-1597.
- Ballantine, Paul , Yongjia Lin, and Ekant Veer. 2015. The influence of user comments on perceptions of Facebook relationship status updates. *Computers in Human Behavior*, 49, 50-55.
- Ballantine, Paul W, and Rachel J Stephenson. 2011. Help me, I'm fat! Social support in online weight loss networks. *Journal of Consumer Behaviour*, 10(6), 332-337.
- Bandura, Albert. 1991. Social cognitive theory of self-regulation. *Organizational Behavior and Human Decision Processes*, 50(2), 248-287.
- Bandura, Albert. 2001. Social Cognitive Theory: An Agentic Perspective. *Annual Review of Psychology*, 52(1), 1-26. doi: 10.1146/annurev.psych.52.1.1
- Banjanin, Nikolina, Nikola Banjanin, Ivan Dimitrijevic, and Igor Pantic. 2015. Relationship between internet use and depression: focus on physiological mood oscillations, social networking and online addictive behavior. *Computers in Human Behavior*, 43, 308-312.
- Bányai, Fanni, Ágnes Zsila, Orsolya Király, Aniko Maraz, Zsuzsanna Elekes, Mark D Griffiths et al. 2017. Problematic Social Media Use: Results From a Large-scale Nationally Representative Adolescent Sample. *PLoS One*, 12(1).
- Baumeister, Roy. 2019. Self-control, Ego Depletion, and Social Psychology's Replication Crisis. doi: 10.31234/osf.io/uf3cn
- Baumeister, Roy F. 2017. Addiction, cigarette smoking, and voluntary control of action: Do cigarette smokers lose their free will? *Addictive Behaviors Reports*, 5, 67-84.
- Baumeister, Roy, Kathleen D. Vohs, and Dianne M. Tice. 2007. The Strength Model of Self-Control. *Current Directions in Psychological Science*, 16(6), 351-355. doi: 10.1111/j.1467-8721.2007.00534.x

References

- Bearman, Margaret, Calvin D Smith, Angela Carbone, Susan Slade, Chi Baik, Marnie Hughes-Warrington et al. 2012. Systematic review methodology in higher education. *Higher Education Research & Development*, 31(5), 625-640.
- Beckmann, J., and M. Kazén. 1994. *Volition and personality. Action versus state orientation*: Hogrefe & Huber.
- Bener, Abdulbari, Huda S Al-Mahdi, Awab I Ali, Mohammed Al-Nufal, Pankit J Vachhani, and Ihab Tewfik. 2011. Obesity and low vision as a result of excessive Internet use and television viewing. *International Journal of Food Sciences and Nutrition*, 62(1), 60-62.
- Benjamin, Daniel J, James O Berger, Magnus Johannesson, Brian A Nosek, E-J Wagenmakers, Richard Berk et al. 2018. Redefine statistical significance. *Nature Human Behaviour*, 2(1), 6.
- Berger, Jonah, and Eva Buechel. (2012). *Facebook Therapy? Why Do People Share Self-Relevant Content Online?* Paper presented at the Why Do People Share Self-Relevant Content Online.
- Berkman, Elliot T, Cendri A Hutcherson, Jordan L Livingston, Lauren E Kahn, and Michael Inzlicht. 2017. Self-control as value-based choice. *Current Directions in Psychological Science*, 26(5), 422-428.
- Bian, Mengwei, and Louis Leung. 2015. Linking loneliness, shyness, smartphone addiction symptoms, and patterns of smartphone use to social capital. *Social Science Computer Review*, 33(1), 61-79.
- Bianchi, Adriana, and James G Phillips. 2005. Psychological predictors of problem mobile phone use. *CyberPsychology & Behavior*, 8(1), 39-51.
- Bickham, David S, Emily A Blood, Courtney E Walls, Lydia A Shrier, and Michael Rich. 2013. Characteristics of Screen Media Use Associated with Higher BMI in Young Adolescents. *Pediatrics*, 131(5), 935-941.

References

- Biener, Lois, and Alison B Albers. 2004. Young adults: vulnerable new targets of tobacco marketing. *American Journal of Public Health*, 94(2), 326-330.
- Billieux, Joel, and Martial Van der Linden. 2012. Problematic Use of the Internet and Self-regulation: A Review of the Initial Studies. *The Open Addiction Journal*, 5, 24-29.
- Billieux, Joël, Martial Van der Linden, and Lucien Rochat. 2008. The role of impulsivity in actual and problematic use of the mobile phone. *Applied Cognitive Psychology: The Official Journal of the Society for Applied Research in Memory and Cognition*, 22(9), 1195-1210.
- Bjartveit, Kjell, and Aage Tverdal. 2005. Health consequences of smoking 1–4 cigarettes per day. *Tobacco control*, 14(5), 315-320.
- Błachnio, Agata, and Aneta Przepiorka. 2016. Dysfunction of self-regulation and self-control in Facebook addiction. *Psychiatric Quarterly*, 87(3), 493-500.
- Blair, Irene V, Jennifer E Ma, and Alison P Lenton. 2001. Imagining stereotypes away: the moderation of implicit stereotypes through mental imagery. *Journal of Personality and Social Psychology*, 81(5), 828.
- Blinka, Lukas, Kateřina Škařupová, Anna Ševčíková, Klaus Wölfling, Kai W Müller, and Michael Dreier. 2015. Excessive Internet Use in European Adolescents: What Determines Differences in Severity? *International Journal of Public Health*, 60(2), 249-256.
- Bolander, Willy, Cinthia B Satornino, Douglas E Hughes, and Gerald R Ferris. 2015. Social networks within sales organizations: Their development and importance for salesperson performance. *Journal of Marketing*, 79(6), 1-16.
- Bower, Gordon H. 1972. *Psychology of Learning and Motivation, Volume 6*: Academic Press.

References

- Bowles, Nellie. 2018. *Is the Answer to Phone Addiction a Worse Phone?*
<https://www.nytimes.com/2018/01/12/technology/grayscale-phone.html>
- Brand, Matthias, Kimberly S Young, Christian Laier, Klaus Wölfling, and Marc N Potenza. 2016. Integrating psychological and neurobiological considerations regarding the development and maintenance of specific Internet-use disorders: An Interaction of Person-Affect-Cognition-Execution (I-PACE) model. *Neuroscience & Biobehavioral Reviews*, 71, 252-266.
- Brenkert, George G. 2019. Mind the Gap! The Challenges and Limits of Business Ethics. *Journal of Business Ethics*, 155(4), 917-930.
- Britt, Jonathan P, and Antonello Bonci. 2013. Alcohol and tobacco: how smoking may promote excessive drinking. *Neuron*, 79(3), 406-407.
- Brooks, Stoney. 2015. Does personal social media usage affect efficiency and well-being? *Computers in Human Behavior*, 46, 26-37. doi: 10.1016/j.chb.2014.12.053
- Burke, M., C. Marlow, and T. Lento. (2010). *Social network activity and social well-being*. Paper presented at the Proceedings of the SIGCHI conference on human factors in computing systems.
- Busby, Mattha. 2018. *Social media copies gambling methods 'to create psychological cravings'*. <https://www.theguardian.com/technology/2018/may/08/social-media-copies-gambling-methods-to-create-psychological-cravings>
- canterbury.ac.nz. 2020. UC Library:: Databases and Journals.
- Cao, Fenglin, Linyan Su, TieQiao Liu, and Xueping Gao. 2007. The relationship between impulsivity and Internet addiction in a sample of Chinese adolescents. *European Psychiatry*, 22(7), 466-471. doi: 10.1016/j.eurpsy.2007.05.004
- Cao, Xiongfei, Ayesha Masood, Adeel Luqman, and Ahmed Ali. 2018. Excessive use of mobile social networking sites and poor academic performance: Antecedents

References

- and consequences from stressor-strain-outcome perspective. *Computers in Human Behavior*, 85, 163-174.
- Caplan, Scott E. 2010. Theory and measurement of generalized problematic Internet use: A two-step approach. *Computers in Human Behavior*, 26(5), 1089-1097.
- Caplan, Scott E, and Andrew C High. 2006. Beyond Excessive Use: The Interaction Between Cognitive and Behavioral Symptoms of Problematic Internet Use. *Communication Research Reports*, 23(4), 265-271.
- Caplan, Scott E. 2002. Problematic Internet use and psychosocial well-being: development of a theory-based cognitive-behavioral measurement instrument. *Computers in Human Behavior*, 18(5), 553-575. doi: 10.1016/S0747-5632(02)00004-3
- Carnevale, Jessica J, Kentaro Fujita, H Anna Han, and Elinor Amit. 2015. Immersion versus transcendence: How pictures and words impact evaluative associations assessed by the implicit association test. *Social Psychological and Personality Science*, 6(1), 92-100.
- Carpenter, Thomas, Ruth Pogacar, Chris Pullig, Michal Kouril, Stephen J Aguilar, Jordan P LaBouff et al. 2018. Survey-software Implicit Association Tests: A Methodological and Empirical Analysis. *PsyArXiv*.
- Carpenter, Tom, Ruth Pogacar, Chris Pullig, Michal Kouril, Jordan LaBouff, Stephen J Aguilar et al. 2017. Conducting IAT research within online surveys: a procedure, validation, and open source tool. *PsyArXiv*.
- Carter, Brian L, and Stephen T Tiffany. 2001. The cue-availability paradigm: the effects of cigarette availability on cue reactivity in smokers. *Experimental and Clinical Psychopharmacology*, 9(2), 183.

References

- Carter, Michelle, and Varun Grover. 2015. Me, my self, and I (T) conceptualizing information technology identity and its implications. *Mis Quarterly*, 39(4), 931-958.
- Carver, Charles S 2004. Self-regulation of action and affect. In K. D. Vohs & R. F. Baumeister (Eds.) *Handbook of self-regulation: Research, theory, and applications*: (pp. 13-39). The Guilford Press.
- Carver, Charles S. 2005. Impulse and constraint: Perspectives from personality psychology, convergence with theory in other areas, and potential for integration. *Personality and Social Psychology Review*, 9(4), 312-333.
- Carver, Charles S, and Michael F Scheier. 2001. *On the Self-regulation of Behavior*: Cambridge University Press.
- Caswell, AJ, MA Celio, MJ Morgan, and T Duka. 2016. Impulsivity as a multifaceted construct related to excessive drinking among UK students. *Alcohol and alcoholism*, 51(1), 77-83.
- Caswell, Amy J, Mark A Celio, Michael J Morgan, and Theodora Duka. 2015. Impulsivity as a Multifaceted Construct Related to Excessive Drinking Among UK Students. *Alcohol and Alcoholism*, 51(1), 77-83.
- Chamberlain, Samuel R, Konstantinos Ioannidis, and Jon E Grant. 2018. The Impact of Comorbid Impulsive/Compulsive Disorders in Problematic Internet Use. *Journal of Behavioral Addictions*, 7(2), 269-275.
- Chawla, SD. 2017. One-size-fits-all threshold for P values under fire. Scientists hit back at a proposal to make it tougher to call findings statistically significant. *Nature News*.
- Chen, Sue-Huei, Li-Jen Weng, Yi-Jen Su, Ho-Mao Wu, and Pin-Feng Yang. 2003. Development of a Chinese Internet addiction scale and its psychometric study. *Chinese Journal of Psychology*, 45(3), 279-294.

References

- Chik, Alice. 2014. Digital gaming and language learning: Autonomy and community. *Language Learning & Technology*, 18(2), 85-100.
- Chin, Wynne W. 1998. The Partial Least Squares Approach to Structural Equation Modeling. *Modern Methods for Business Research*, 295(2), 295-336.
- Chotpitayasunondh, Varoth, and Karen M. Douglas. 2016. How “phubbing” becomes the norm: The antecedents and consequences of snubbing via smartphone. *Computers in Human Behavior*, 63, 9-18. doi: doi.org/10.1016/j.chb.2016.05.018
- Clayton, Russell B, Glenn Leshner, and Anthony Almond. 2015. The extended iSelf: the impact of iPhone separation on cognition, emotion, and physiology. *Journal of Computer-Mediated Communication*, 20(2), 119-135.
- Cohen, Jacob. 1988. *Statistical Power Analysis for the Behavioral Sciences*: Hillsdale, NJ: Lawrence Erlbaum Associates.
- Collins. 2017. 'Extreme users': One in six Kiwi teens online for 6+ hours a day. http://www.nzherald.co.nz/nz/news/article.cfm?c_id=1&objectid=11841147
- Collins, R Lorraine, William H George, and William M Lapp. 1989. Drinking restraint: Refinement of a construct and prediction of alcohol consumption. *Cognitive Therapy and Research*, 13(5), 423-440.
- Collins, R Lorraine, and William M Lapp. 1992. The Temptation and Restraint Inventory for measuring drinking restraint. *Addiction*, 87(4), 625-633.
- collinsdictionary.com. 2019. *Synonyms and antonyms for the word "moody"*. <https://www.collinsdictionary.com/dictionary/english-thesaurus/moody>
- Coulson, David C. 2013. Dynamics of social media, politics and public policy in the Arab World. *Global Media Journal*, 12(22), 1-20.

References

- Coyne, Sarah M, Adam A Rogers, Jessica D Zurcher, Laura Stockdale, and McCall Booth. 2020. Does Time Spent Using Social Media Impact Mental Health?: An Eight Year Longitudinal Study. *Computers in Human Behavior*, 104, 1-9.
- Crockett, David, Hilary Downey, A. Fuat Firat, Julie L. Ozanne, and Simone Pettigrew. 2013. Conceptualizing a transformative research agenda. *Journal of Business Research*, 66(8), 1171-1178. doi: 10.1016/j.jbusres.2012.08.009
- Cudo, Andrzej, Małgorzata Torój, Marcin Demczuk, and Piotr Francuz. 2019. Dysfunction of Self-Control in Facebook Addiction: Impulsivity Is the Key. *Psychiatric Quarterly*, 1-11.
- d'Astous, Alain, Julie Maltais, and Caroline Roberge. (1990). *Compulsive buying tendencies of adolescent consumers*. Paper presented at the ACR North American Advances.
- Dasgupta, Nilanjana, and Anthony G Greenwald. 2001. On the malleability of automatic attitudes: combating automatic prejudice with images of admired and disliked individuals. *Journal of Personality and Social Psychology*, 81(5), 800.
- Davenport, Kate, James E. Houston, and Mark D. Griffiths. 2012. Excessive Eating and Compulsive Buying Behaviours in Women: An Empirical Pilot Study Examining Reward Sensitivity, Anxiety, Impulsivity, Self-Esteem and Social Desirability. *International Journal of Mental Health and Addiction*, 10(4), 474-489. doi: 10.1007/s11469-011-9332-7
- Davila, Joanne, Rachel Hershenberg, Brian A Feinstein, Kaitlyn Gorman, Vickie Bhatia, and Lisa R Starr. 2012. Frequency and quality of social networking among young adults: Associations with depressive symptoms, rumination, and corumination. *Psychology of Popular Media Culture*, 1(2), 72.

References

- Davis, C, C Zai, RD Levitan, AS Kaplan, JC Carter, C Reid-Westoby et al. 2011. Opiates, overeating and obesity: a psychogenetic analysis. *International journal of obesity*, 35(10), 1347-1354.
- Davis, Caroline, and John Fox. 1993. Excessive exercise and weight preoccupation in women. *Addictive Behaviors*, 18(2), 201-211.
- Davis, Fred D, Richard P Bagozzi, and Paul R Warshaw. 1992. Extrinsic and intrinsic motivation to use computers in the workplace 1. *Journal of Applied Social Psychology*, 22(14), 1111-1132.
- Davis, Katie. 2013. Young people's digital lives: The impact of interpersonal relationships and digital media use on adolescents' sense of identity. *Computers in Human Behavior*, 29(6), 2281-2293.
- Davis, Richard A. 2001. A cognitive-behavioral model of pathological Internet use. *Computers in Human Behavior*, 17(2), 187-195.
- Davis, Richard A, Gordon L Flett, and Avi Besser. 2002. Validation of a New Scale for Measuring Problematic Internet Use: Implications for Pre-employment Screening. *Cyberpsychology & Behavior*, 5(4), 331-345.
- Davis, Tim RV, and Fred Luthans. 1980. A social learning approach to organizational behavior. *Academy of Management Review*, 5(2), 281-290.
- de Vries, Huibert Peter, Ekant Veer, and Kate Victoria de Vries. 2018. An examination of SME social media use in the food industry. *Small Enterprise Research*, 25(3), 227-238.
- Deci, Edward L, and Richard M Ryan. 1985. The general causality orientations scale: Self-determination in personality. *Journal of Research in Personality*, 19(2), 109-134.
- Delaney, Daniel, LAR Stein, and Russell Gruber. 2018. Facebook Addiction and Impulsive Decision-Making. *Addiction Research & Theory*, 26(6), 478-486.

References

- Diamond, Adele. 2013. Executive functions. *Annual Review of Psychology*, 64, 135-168.
- Diehl, Manfred, Angelenia B Semegon, and Ralf Schwarzer. 2006. Assessing attention control in goal pursuit: A component of dispositional self-regulation. *Journal of Personality Assessment*, 86(3), 306-317.
- Disseler, Shirley A, and Tawannah G Allen. 2016. Using Online Gaming as a Teacher Test Prep Model for Mathematics. *International Journal of Strategic Information Technology and Applications (IJSITA)*, 7(3), 56-68.
- Dittmar, Helga, and Jane Beattie. 1998. Impulsive and excessive buying behaviour. *Choice and Public Policy*, 123-144.
- Dittmar, Helga, and John Drury. 2000. Self-image—is it in the bag? A qualitative comparison between “ordinary” and “excessive” consumers. *Journal of Economic Psychology*, 21(2), 109-142.
- Doebel, Sabine, Laura E Michaelson, and Yuko Munakata. 2017. Beyond Personal Control: The Role of Developing Self-control Abilities in the Behavioral Constellation of Deprivation. *Behavioral and Brain Sciences*, 40, 24-25.
- Du, Jie, Peter Kerkhof, and Guido M van Koningsbruggen. 2019. Predictors of social media self-control failure: Immediate gratifications, habitual checking, ubiquity, and notifications. *Cyberpsychology, Behavior, and Social Networking*, 22(7), 477-485.
- Du, Jie, Guido M van Koningsbruggen, and Peter Kerkhof. 2018. A brief measure of social media self-control failure. *Computers in Human Behavior*, 84, 68-75.
- Duckworth, Angela L., Tamar Szabó Gendler, and James J. Gross. 2016. Situational Strategies for Self-Control. *Perspectives on Psychological Science*, 11(1), 35-55. doi: 10.1177/1745691615623247

References

- Dworak, Markus, Thomas Schierl, Thomas Bruns, and Heiko Klaus Strüder. 2007. Impact of singular excessive computer game and television exposure on sleep patterns and memory performance of school-aged children. *Pediatrics*, 120(5), 978-985.
- Esser, Marissa B, Heather Clayton, Zewditu Demissie, Dafna Kanny, and Robert D Brewer. 2017. Current and binge drinking among high school students—United States, 1991–2015. *MMWR. Morbidity and mortality weekly report*, 66(18), 474.
- Evans, J. S. B. 2008. Dual-processing accounts of reasoning, judgment, and social cognition. *Annual Review of Psychology*, 59, 255-278.
- Evans, Jonathan St BT. (2006). *Dual system theories of cognition: Some issues*. Paper presented at the Proceedings of the Annual Meeting of the Cognitive Science Society.
- Faber, Ronald J, and Thomas C O'guinn. 1992. A clinical screener for compulsive buying. *Journal of Consumer Research*, 19(3), 459-469.
- Fagan, Pebbles, Erik Augustson, Cathy L Backinger, Mary E O'Connell, Robert E Vollinger Jr, Annette Kaufman et al. 2007. Quit attempts and intention to quit cigarette smoking among young adults in the United States. *American journal of public health*, 97(8), 1412-1420.
- Falk, R Frank, and Nancy B Miller. 1992. *A Primer for Soft Modeling*: University of Akron Press.
- Farrell, Lisa. 2018. Understanding the Relationship Between Subjective Wellbeing and Gambling Behavior. *Journal of Gambling Studies*, 34(1), 55-71. doi: 10.1007/s10899-017-9692-4
- Fichman, Robert G, and Chris F Kemerer. 1997. The assimilation of software process innovations: An organizational learning perspective. *Management Science*, 43(10), 1345-1363.

References

- Firat, Mehmet. 2017. Relationship between Self-Control and Facebook Use: Case of CEIT Students. *Educational Sciences: Theory and Practice*, 17(4), 1179-1201.
- Fisher, R. A. 1950. *Statistical Methods for Research Workers* Oliver & Boyd, Edinburgh.
- Fletcher, Amber J. 2017. Applying critical realism in qualitative research: methodology meets method. *International journal of social research methodology*, 20(2), 181-194.
- Florescu, Ana, Roberta Ferrence, Tom Einarson, Peter Selby, Offie Soldin, and Gideon Koren. 2009. Methods for quantification of exposure to cigarette smoking and environmental tobacco smoke: focus on developmental toxicology. *Therapeutic drug monitoring*, 31(1), 14.
- Flyvbjerg, Bent. 2001. *Making Social Science Matter: Why Social Inquiry Fails and how it can Succeed Again*: Cambridge university press.
- Follmer, D Jake, Rayne A Sperling, and Hoi K Suen. 2017. The role of Mturk in education research: Advantages, issues, and future directions. *Educational Researcher*, 46(6), 329-334.
- Fornell, Claes, and David F Larcker. 1981. Evaluating Structural Equation Models with Unobservable Variables and Measurement Error. *Journal of Marketing Research*, 18(1), 39-50.
- Foroughi, Behzad, Mohammad Iranmanesh, Davoud Nikbin, and Sunghyup Sean Hyun. 2019. Are depression and social anxiety the missing link between Facebook addiction and life satisfaction? The interactive effect of needs and self-regulation. *Telematics and Informatics*, 43, 101247.
- Franken, Ingmar HA. 2003. Drug craving and addiction: integrating psychological and neuropsychopharmacological approaches. *Progress in Neuro-Psychopharmacology and Biological Psychiatry*, 27(4), 563-579.

References

- Franks, Jessica, Richard Chenhall, and Louise Keogh. 2018. The Facebook sabbatical as a cycle: Describing the gendered experience of young adults as they navigate disconnection and reconnection. *Social Media+ Society*, 4(3).
- Friese, Malte, and Wilhelm Hofmann. 2009. Control me or I will control you: Impulses, trait self-control, and the guidance of behavior. *Journal of Research in Personality*, 43(5), 795-805. doi: <https://doi.org/10.1016/j.jrp.2009.07.004>
- Frost, Rachel L, and Debra J Rickwood. 2017. A Systematic Review of the Mental Health Outcomes Associated with Facebook Use. *Computers in Human Behavior*, 76, 576-600. doi: 10.1016/j.chb.2017.08.001
- Fujita, Kentaro. 2011. On conceptualizing self-control as more than the effortful inhibition of impulses. *Personality and Social Psychology Review*, 15(4), 352-366.
- Gainforth, Heather L., Robert West, and Susan Michie. 2015. Assessing Connections Between Behavior Change Theories Using Network Analysis. *Annals of Behavioral Medicine*, 49(5), 754-761. doi: 10.1007/s12160-015-9710-7
- Galer, Sophia Smith. 2018. *How much is 'too much time' on social media?* <http://www.bbc.com/future/story/20180118-how-much-is-too-much-time-on-social-media>
- Gangadharbatla, Harsha. 2008. Facebook Me: Collective Self-esteem, Need to Belong, and Internet Self-efficacy as Predictors of the iGeneration's Attitudes Toward Social Networking Sites. *Journal of Interactive Advertising*, 8(2), 5-15.
- Gao, Qiufeng, Ge Jia, Jun Zhao, and Dandan Zhang. 2019. Inhibitory control in excessive social networking users: Evidence from an ERP-based Go-Nogo task. *Frontiers in Psychology*, 10, 1810.

References

- Gardner, Theodore W, Thomas J Dishion, and Arin M Connell. 2008. Adolescent self-regulation as resilience: Resistance to antisocial behavior within the deviant peer context. *Journal of Abnormal Child Psychology*, 36(2), 273-284.
- Garson, G David. 2016. *Partial Least Squares: Regression and Structural Equation Models*: Asheboro, NC: Statistical Associates Publishers.
- Gathergood, John. 2012. Self-control, Financial Literacy and Consumer Over-indebtedness. *Journal of Economic Psychology*, 33(3), 590-602.
- Gattol, Valentin, Maria Sääksjärvi, and Claus-Christian Carbon. 2011. Extending the implicit association test (IAT): assessing consumer attitudes based on multi-dimensional implicit associations. *PLoS One*, 6(1).
- Gentile, Douglas A, Hyekyung Choo, Albert Liau, Timothy Sim, Dongdong Li, Daniel Fung et al. 2011. Pathological video game use among youths: a two-year longitudinal study. *Pediatrics*, 127(2), e319-e329.
- Gilbert, RM. 1976. Drug abuse as excessive behaviour. *Canadian Psychological Review/Psychologie Canadienne*, 17(3), 231.
- GlobalWebIndex. 2019. *2019 Q1 GlobalWebIndex Social Flagship Report*.
<https://www.globalwebindex.com/hubfs/Downloads/2019%20Q1%20Social%20Flagship%20Report.pdf>
- Godtfredsen, Nina S, Eva Prescott, Jørgen Vestbo, and Merete Osler. 2006. Smoking reduction and biomarkers in two longitudinal studies. *Addiction*, 101(10), 1516-1522.
- Gonzales, Amy, and Jeffrey Hancock. 2010. Mirror, Mirror on My Facebook Wall: Effects of Exposure to Facebook on Self-Esteem. *Cyberpsychology, Behavior, and Social Networking*, 14(1-2), 79-83. doi: 10.1089/cyber.2009.0411

References

- Goswami, Vandana, and Divya Rani Singh. 2016. Impact of mobile phone addiction on adolescent's life: A literature review. *International Journal of Home Science*, 2(1), 69-74.
- Gottfredson, Michael R, and Travis Hirschi. 1990. *A general Theory of Crime*: Stanford University Press.
- Gough, David. 2007. Weight of evidence: a framework for the appraisal of the quality and relevance of evidence. *Research Papers in Education*, 22(2), 213-228.
- Govind, Rahul, Jatinder Jit Singh, Nitika Garg, and Shachi D'Silva. 2019. Not Walking the Walk: How Dual Attitudes Influence Behavioral Outcomes in Ethical Consumption. *Journal of Business Ethics*, 155(4), 1195-1214.
- Grant, Jon E, and Samuel R Chamberlain. 2014. Impulsive Action and Impulsive Choice Across Substance and Behavioral Addictions: Cause or Consequence? *Addictive Behaviors*, 39(11), 1632-1639.
- Grasmick, Harold G, Charles R Tittle, Robert J Bursik Jr, and Bruce J Arneklev. 1993. Testing the core empirical implications of Gottfredson and Hirschi's general theory of crime. *Journal of Research in Crime and Delinquency*, 30(1), 5-29.
- Greenwald, Anthony G, Debbie E McGhee, and Jordan LK Schwartz. 1998. Measuring Individual Differences in Implicit Cognition: the Implicit Association Test. *Journal of Personality and Social Psychology*, 74(6), 1464-1480. doi: 10.1037//0022-3514.74.6.1464
- Greenwald, Anthony G, Brian A Nosek, and Mahzarin R Banaji. 2003. Understanding and using the implicit association test: I. An improved scoring algorithm. *Journal of Personality and Social Psychology*, 85(2), 197.
- Greenwald, Anthony G., Mahzarin R. Banaji, Laurie A. Rudman, Shelly D. Farnham, Brian A. Nosek, and Deborah S. Mellott. 2002. A unified theory of implicit

References

- attitudes, stereotypes, self-esteem, and self-concept. *Psychological Review*, 109(1), 3-25. doi: 10.1037/0033-295x.109.1.3
- Greenwald, T., M. Banaji, and B. Nosek. 2019. *Project Implicit*.
<https://implicit.harvard.edu/implicit/demo/background/raceinfo.html>
- Gregoire, C. 2015. *You Probably Use Your Smartphone Way More Than You Think*.
https://www.huffingtonpost.com/entry/smartphone-usage-estimates_us_5637687de4b063179912dc96
- Griffiths, Mark D, Daria J Kuss, and Zsolt Demetrovics 2014. Social networking addiction: An overview of preliminary findings. In K. P. Rosenberg & L. Curtiss (Eds.) *Behavioral Addictions*: (pp. 119-141). Academic Press.
- Griffiths, Mark, Jonathan Parke, and Richard Wood. 2002. Excessive Gambling and Substance Abuse: is There a Relationship? *Journal of Substance Use*, 7(4), 187-190.
- Guedes, Eduardo, Federica Sancassiani, Mauro Giovani Carta, Carlos Campos, Sergio Machado, Anna Lucia Spear King et al. 2016. Internet addiction and excessive social networks use: What about Facebook? *Clinical Practice and Epidemiology in Mental Health: CP & EMH*, 12, 43.
- Gunuc, Selim, and Ayten Dogan. 2013. The Relationships Between Turkish Adolescents' Internet Addiction, Their Perceived Social Support and Family Activities. *Computers in Human Behavior*, 29(6), 2197-2207.
- Gutmann, Justin. 2012. Book Review: Transformative Consumer Research. *International Journal of Market Research*, 54(6), 863-864.
- Haenlein, Michael, and Andreas M Kaplan. 2004. A beginner's guide to partial least squares analysis. *Understanding Statistics*, 3(4), 283-297.
- Hagger, Martin S. 2013. The multiple pathways by which self-control predicts behavior. *Frontiers in Psychology*, 4, 849.

References

- Hair Jr, Joseph F, G Tomas M Hult, Christian Ringle, and Marko Sarstedt. 2016. *A Primer on Partial Least Squares Structural Equation Modeling (PLS-SEM)*: Sage publications.
- Hajli, M Nick. 2014. A study of the impact of social media on consumers. *International Journal of Market Research*, 56(3), 387-404.
- Hajli, Nick. 2018. Ethical environment in the online communities by information credibility: a social media perspective. *Journal of Business Ethics*, 149(4), 799-810.
- Hardie, Elizabeth, and Ming Yi Tee. 2007. Excessive Internet use: The role of personality, loneliness and social support networks in Internet Addiction. *Australian Journal of Emerging Technologies & Society*, 5(1).
- Hatsukami, Dorothy K, Neal L Benowitz, Stephen I Rennard, Cheryl Oncken, and Stephen S Hecht. 2006. Biomarkers to assess the utility of potential reduced exposure tobacco products. *Nicotine & Tobacco Research*, 8(2), 169-191.
- He, Qinghua, Ofir Turel, and Antoine Bechara. 2017. Brain Anatomy Alterations Associated with Social Networking Site (SNS) Addiction. *Scientific Reports*, 7, 45064.
- health.govt.nz. 2020. *Definitions of smoking status*. <https://www.health.govt.nz/our-work/preventative-health-wellness/tobacco-control/tobacco-control-information-practitioners/definitions-smoking-status>
- Healy, Marilyn, and Chad Perry. 2000. Comprehensive criteria to judge validity and reliability of qualitative research within the realism paradigm. *Qualitative market research: An international journal*.
- Hellman, Matilda, Tim M Schoenmakers, Benjamin R Nordstrom, and Ruth J van Holst. 2013. Is there such a thing as online video game addiction? A cross-disciplinary review. *Addiction Research & Theory*, 21(2), 102-112.

References

- Helsper, Ellen Johanna, and David Smahel. 2019. Excessive internet use by young Europeans: psychological vulnerability and digital literacy? *Information, Communication & Society*, 1-19.
- Henseler, Jörg, Geoffrey Hubona, and Pauline Ash Ray. 2016. Using PLS Path Modeling in New Technology Research: Updated Guidelines. *Industrial Management & Data Systems*, 116(1), 2-20.
- Henseler, Jörg, Christian M Ringle, and Marko Sarstedt. 2015. A New Criterion for Assessing Discriminant Validity in Variance-based Structural Equation Modeling. *Journal of the Academy of Marketing Science*, 43(1), 115-135.
- Herrero, Juan, Alberto Urueña, Andrea Torres, and Antonio Hidalgo. 2019. Socially connected but still isolated: Smartphone addiction decreases social support over time. *Social Science Computer Review*, 37(1), 73-88.
- Higgins, E Tory. 1987. Self-discrepancy: a theory relating self and affect. *Psychological Review*, 94(3), 319.
- Hinings, C Robert. 1997. Reflections on processual research. *Scandinavian Journal of Management*, 13(4), 493-503.
- Hirschi, Travis. 1969. *Causes of Delinquency*: CA: University of California Press.
- Hitsman, Brian, Biing-Jiun Shen, Ronald A Cohen, Sandra B Morissette, David J Drobes, Bonnie Spring et al. 2010. Measuring smoking-related preoccupation and compulsive drive: evaluation of the obsessive compulsive smoking scale. *Psychopharmacology*, 211(4), 377-387.
- Ho, Shirley S, May O Lwin, and Edmund WJ Lee. 2017. Till logout do us part? Comparison of factors predicting excessive social network sites use and addiction between Singaporean adolescents and adults. *Computers in Human Behavior*, 75, 632-642.

References

- Hoch, Stephen J, and George F Loewenstein. 1991. Time-inconsistent preferences and consumer self-control. *Journal of Consumer Research*, 17(4), 492-507.
- Hoffman, Donna L 2012. Internet indispensability, online social capital, and consumer well-being. In D. G. Mick, S. Pettigrew, C. Pechmann & J. L. Ozanne (Eds.) *Transformative Consumer Research for Personal and Collective Well-being*: (pp. 193-204). Routledge.
- Hoffman, W Michael, and Jennifer Mills Moore. 1982. What is business ethics? A reply to Peter Drucker. *Journal of Business Ethics*, 1(4), 293-300.
- Hofmann, Wilhelm, Malte Friese, and Fritz Strack. 2009. Impulse and Self-Control From a Dual-Systems Perspective. *Perspectives on Psychological Science*, 4(2), 162-176. doi: 10.1111/j.1745-6924.2009.01116.x
- Hofmann, Wilhelm, Leonard Reinecke, and Adrian Meier 2016. Self-Control as a Moderator of the Effects of Media Use on Well-Being. In L. Reinecke & M. B. Oliver (Eds.) *The Routledge Handbook of Media Use and Well-being: International Perspectives on Theory and Research on Positive Media Effects*: (pp. 211). Routledge.
- Hofmann, Wilhelm, Kathleen D Vohs, and Roy F Baumeister. 2012. What people desire, feel conflicted about, and try to resist in everyday life. *Psychological Science*, 23(6), 582-588.
- Holmes, Emily A, Andrew Mathews, Tim Dalgleish, and Bundy Mackintosh. 2006. Positive interpretation training: Effects of mental imagery versus verbal training on positive mood. *Behavior Therapy*, 37(3), 237-247.
- Hong, Fu-Yuan, Der-Hsiang Huang, Hung-Yu Lin, and Su-Lin Chiu. 2014. Analysis of the psychological traits, Facebook usage, and Facebook addiction model of Taiwanese university students. *Telematics and Informatics*, 31(4), 597-606.

References

- Horvath, Cary W. 2004. Measuring television addiction. *Journal of Broadcasting & Electronic Media*, 48(3), 378-398.
- Hou, Yubo, Dan Xiong, Tonglin Jiang, Lily Song, and Qi Wang. 2019. Social media addiction: Its impact, mediation, and intervention. *Cyberpsychology: Journal of Psychosocial Research on Cyberspace*, 13(1).
- Hull, Michael GR, Kate North, Hazel Taylor, Alexandra Farrow, and W Christopher L Ford. 2000. Delayed conception and active and passive smoking. *Fertility and sterility*, 74(4), 725-733.
- Hulland, John, and Jeff Miller. 2018. "Keep on Turkin"? *Journal of the Academy of Marketing Science*, 46(5), 789-794.
- Husten, Corinne G. 2009. How should we define light or intermittent smoking? Does it matter? *Nicotine & Tobacco Research*, 11(2), 111.
- Inoue, Yuhei, and Aubrey Kent. 2014. A Conceptual Framework for Understanding the Effects of Corporate Social Marketing on Consumer Behavior. *Journal of Business Ethics*, 121(4), 621-633. doi: 10.1007/s10551-013-1742-y
- Ioannidis, K., S. R. Chamberlain, M. S. Treder, F. Kiraly, E. W. Leppink, S. A. Redden et al. 2016. Problematic internet use (PIU): Associations with the impulsive-compulsive spectrum. An application of machine learning in psychiatry. *Journal of Psychiatric Research*, 83, 94-102. doi: 10.1016/j.jpsychires.2016.08.010
- Iranmanesh, Mohammad, Behzad Foroughi, Davoud Nikbin, and Sunghyup Sean Hyun. 2019. Shyness, self-esteem, and loneliness as causes of FA: The moderating effect of low self-control. *Current Psychology*, 1-12.
- Jakobsen, Morten, and Rasmus Jensen. 2015. Common method bias in public management studies. *International Public Management Journal*, 18(1), 3-30.

References

- Jamieson, Jeremy P, and Stephen G Harkins. 2011. The intervening task method: Implications for measuring mediation. *Personality and Social Psychology Bulletin*, 37(5), 652-661.
- Jelenchick, Lauren A., Jens C. Eickhoff, and Megan A. Moreno. 2012. Social Networking Site Use and Depression in Older Adolescents. *Journal of Adolescent Health*, 52(1), 128-130. doi: 10.1016/j.jadohealth.2012.05.008
- Johnson, Daniel, Ella Horton, Rory Mulcahy, and Marcus Foth. 2017. Gamification and serious games within the domain of domestic energy consumption: A systematic review. *Renewable and Sustainable Energy Reviews*, 73, 249-264.
- Johnston, Olwyn, Jackie Reilly, and John Kremer. 2011. Excessive exercise: From quantitative categorisation to a qualitative continuum approach. *European Eating Disorders Review*, 19(3), 237-248.
- Kahneman, Daniel. 2011. *Thinking, Fast and Slow*: Macmillan.
- Kahneman, Daniel, and Alan B Krueger. 2006. Developments in the measurement of subjective well-being. *Journal of Economic Perspectives*, 20(1), 3-24.
- Kahneman, Daniel, and Amos Tversky. 1973. On the psychology of prediction. *Psychological Review*, 80(4), 237.
- Kahneman, Daniel, and Amos Tversky 2013. Prospect theory: An analysis of decision under risk. In L. C. MacLean & W. T. Ziemba (Eds.) *Handbook of the Fundamentals of Financial Decision Making: Part I*: (pp. 99-127). World Scientific.
- Kalpidou, Maria, Dan Costin, and Jessica Morris. 2010. The Relationship Between Facebook and the Well-Being of Undergraduate College Students. *CyberPsychology, behavior, and social networking*, 14(4), 183-189. doi: 10.1089/cyber.2010.0061

References

- Kanev, Dimitar, and Venelin Terziev. 2017. Behavioral Economics: Development, Condition and Perspectives. *IJASOS-International E-Journal of Advances in Social Sciences*, 3(8).
- Kanny, Dafna, Timothy S Naimi, Yong Liu, and Robert D Brewer. 2020. Trends in Total Binge Drinks per Adult Who Reported Binge Drinking—United States, 2011–2017. *Morbidity and Mortality Weekly Report*, 69(2), 30.
- Kaplan, Andreas M, and Michael Haenlein. 2010. Users of the world, unite! The challenges and opportunities of Social Media. *Business horizons*, 53(1), 59-68.
- Karlsson, Jan, Lars-Olof Persson, Lars Sjöström, and Marriane Sullivan. 2000. Psychometric properties and factor structure of the Three-Factor Eating Questionnaire (TFEQ) in obese men and women. Results from the Swedish Obese Subjects (SOS) study. *International Journal of Obesity*, 24(12), 1715.
- Karpinski, Andrew, and James L Hilton. 2001. Attitudes and the implicit association test. *Journal of Personality and Social Psychology*, 81(5), 774.
- Karpinski, Andrew, and Ross B. Steinman. 2006. The Single Category Implicit Association Test as a Measure of Implicit Social Cognition. *Journal of Personality and Social Psychology*, 91(1), 16-32. doi: 10.1037/0022-3514.91.1.16
- Katz, Elihu, Jay G Blumler, and Michael Gurevitch. 1973. Uses and gratifications research. *The Public Opinion Quarterly*, 37(4), 509-523.
- Kietzmann, Jan H, Kristopher Hermkens, Ian P McCarthy, and Bruno S Silvestre. 2011. Social media? Get serious! Understanding the functional building blocks of social media. *Business Horizons*, 54(3), 241-251.
- Kim, Eun Joo, Kee Namkoong, Taeyun Ku, and Se Joo Kim. 2008. The relationship between online game addiction and aggression, self-control and narcissistic

References

- personality traits. *European Psychiatry*, 23(3), 212-218. doi: 10.1016/j.eurpsy.2007.10.010
- Kim, Junghyun, and Paul M Haridakis. 2009. The role of Internet user characteristics and motives in explaining three dimensions of Internet addiction. *Journal of Computer-Mediated Communication*, 14(4), 988-1015.
- Kim, Sae Won, and Chong Ju Choi. 2007. Habits, Self-control and Social Conventions: the Role of Global Media and Corporations. *Journal of Business Ethics*, 76(2), 147-154.
- Király, Orsolya, Mark D Griffiths, and Zsolt Demetrovics. 2015. Internet gaming disorder and the DSM-5: Conceptualization, debates, and controversies. *Current Addiction Reports*, 2(3), 254-262.
- Kirschner, Paul A, and Aryn C Karpinski. 2010. Facebook® and academic performance. *Computers in Human Behavior*, 26(6), 1237-1245.
- Ko, Chih-Hung. 2014. Internet gaming disorder. *Current Addiction Reports*, 1(3), 177-185.
- Koc, Mustafa, and Seval Gulyagci. 2013. Facebook addiction among Turkish college students: The role of psychological health, demographic, and usage characteristics. *Cyberpsychology, Behavior, and Social Networking*, 16(4), 279-284.
- Koeske, Gary F, and Randi Daimon Koeske. 1993. A preliminary test of a stress-strain-outcome model for reconceptualizing the burnout phenomenon. *Journal of Social Service Research*, 17(3-4), 107-135.
- Kosinski, Michal, David Stillwell, and Thore Graepel. 2013. Private traits and attributes are predictable from digital records of human behavior. *Proceedings of the National Academy of Sciences*, 110(15), 5802-5805.

References

- Kramer, Adam D. I., Jamie E. Guillory, and Jeffrey T. Hancock. 2014. Experimental Evidence of Massive-scale Emotional Contagion Through Social Networks. *Proceedings of the National Academy of Sciences*, 111(24), 8788-8790. doi: 10.1073/pnas.1320040111
- Krasnova, Hanna, Olga Abramova, Isabelle Notter, and Annika Baumann. 2016. Why Phubbing is Toxic for Your Relationship: Understanding the Role Of Smartphone Jealousy among “Generation Y” Users. *Research Papers*, 109.
- Krasnova, Hanna, Helena Wenninger, Thomas Widjaja, and Peter Buxmann. (2013). *Envy on Facebook: A hidden threat to users’ life satisfaction?* Paper presented at the International Conference on Wirtschaftsinformatik
- Kross, Ethan, Philippe Verduyn, Emre Demiralp, Jiyoung Park, David Seungjae Lee, Natalie Lin et al. 2013. Facebook Use Predicts Declines in Subjective Well-being in Young Adults. *PloS One*, 8(8), e69841.
- Kubacki, Krzysztof, Sharyn Rundle-Thiele, Bo Pang, and Nuray Buyucek. 2015. Minimizing alcohol harm: A systematic social marketing review (2000–2014). *Journal of Business Research*, 68(10), 2214-2222.
- Kubacki, Krzysztof, Dariusz Siemieniako, and Sharyn Rundle-Thiele. 2011. College binge drinking: a new approach. *Journal of Consumer Marketing*.
- Kubey, Robert, and Mihaly Csikszentmihalyi. 2002. Television addiction is no mere metaphor. *Scientific American*, 286(2), 74-80.
- Kuhl, Julius. 1981. Motivational and functional helplessness: The moderating effect of state versus action orientation. *Journal of Personality and Social Psychology*, 40(1), 155.
- Kuhl, Julius. 1994. Action versus state orientation: Psychometric properties of the Action Control Scale (ACS-90). *Volition and Personality: Action Versus State Orientation*, 47, 56.

References

- Kuntsche, Emmanuel, Sandra Kuntsche, Johannes Thrul, and Gerhard Gmel. 2017. Binge drinking: Health impact, prevalence, correlates and interventions. *Psychology & health*, 32(8), 976-1017.
- Kushlev, Kostadin, Jason Proulx, and Elizabeth W Dunn. (2016). *Silence your phones: Smartphone notifications increase inattention and hyperactivity symptoms*. Paper presented at the Proceedings of the 2016 CHI conference on human factors in computing systems.
- Kuss, and Griffiths. 2011a. Excessive online social networking: Can adolescents become addicted to Facebook? *Education and Health*, 29(4), 63-66.
- Kuss, D., and M. Griffiths. 2011b. Online Social Networking and Addiction—A Review of the Psychological Literature. *International Journal of Environmental Research and Public Health*, 8(9), 3528-3552.
- Kuss, Daria J, and Mark D Griffiths. 2012. Online gaming addiction in children and adolescents: A review of empirical research. *Journal of Behavioral Addictions*, 1(1), 3-22.
- Kuss, Daria J, and Mark D Griffiths. 2017. Social Networking Sites and Addiction: Ten Lessons Learned. *International Journal of Environmental Research and Public Health*, 14(3), 311.
- Lacey, J Hubert, and CDH Evans. 1986. The Impulsivist: A Multi-impulsive Personality Disorder. *British Journal of Addiction*, 81(5), 641-649.
- Lannoy, Séverine, Armand Chatard, Leila Selimbegovic, Nina Tello, Martial Van der Linden, Alexandre Heeren et al. 2020. Too Good to be Cautious: High Implicit Self-esteem Predicts Self-reported Dangerous Mobile Phone Use. *Computers in Human Behavior*, 103, 208-213.

References

- Lapierre, Dominique, Claude MJ Braun, and Sheilagh Hodgins. 1995. Ventral frontal deficits in psychopathy: Neuropsychological test findings. *Neuropsychologia*, 33(2), 139-151.
- LaRose, Robert, and Matthew S Eastin. 2004. A social cognitive theory of Internet uses and gratifications: Toward a new model of media attendance. *Journal of Broadcasting & Electronic Media*, 48(3), 358-377.
- LaRose, Robert, Carolyn A Lin, and Matthew S Eastin. 2003. Unregulated Internet usage: Addiction, habit, or deficient self-regulation? *Media Psychology*, 5(3), 225-253.
- Lee, Bo Hye, and Hae Kook Lee. 2017. Longitudinal study shows that addictive Internet use during adolescence was associated with heavy drinking and smoking cigarettes in early adulthood. *Acta Paediatrica*, 106(3), 497-502.
- Lee, Edmund WJ, Shirley S Ho, and May O Lwin. 2017. Extending the social cognitive model—Examining the external and personal antecedents of social network sites use among Singaporean adolescents. *Computers in Human Behavior*, 67, 240-251.
- Lee, Hae, Jung-Seok Choi, Young-Chul Shin, Jun-Young Lee, Hee Yeon Jung, and Jun Soo Kwon. 2012a. Impulsivity in Internet Addiction: A Comparison with Pathological Gambling. *Cyberpsychology, behavior, and social networking*, 15, 373-377. doi: 10.1089/cyber.2012.0063
- Lee, Seungsin, Jungkun Park, and Sukhyung Bryan Lee. 2016. The interplay of Internet addiction and compulsive shopping behaviors. *Social Behavior and Personality: an International Journal*, 44(11), 1901-1912.
- Lee, Yu-Kang, Chun-Tuan Chang, You Lin, and Zhao-Hong Cheng. 2014. The Dark Side of Smartphone Usage: Psychological Traits, Compulsive Behavior and Technostress. *Computers in Human Behavior*, 31, 373-383.

References

- Lee, Zach WY, Christy MK Cheung, and Dimple R Thadani. (2012b). *An investigation into the problematic use of Facebook*. Paper presented at the 2012 45th Hawaii International Conference on System Sciences.
- Leng, Yexi, Xi He, Baijie Zhu, Ping Li, Chuan Xiao, and Weiqi He. 2019. The Craving and Excitement of Social Networking Sites Addicts: Based on Cue-Reactivity. *Frontiers in Psychology*, 10.
- Levy, Neil. 2013. *Addiction and Self-control: Perspectives from Philosophy, Psychology, and Neuroscience*: Oxford University Press.
- Lewis, Megan A, and Karen S Rook. 1999. Social Control in Personal Relationships: Impact on Health Behaviors and Psychological Distress. *Health Psychology*, 18(1), 63.
- Lin, Liu Yi, Jaime E Sidani, Ariel Shensa, Ana Radovic, Elizabeth Miller, Jason B Colditz et al. 2016. Association between social media use and depression among US young adults. *Depression and Anxiety*, 33(4), 323-331.
- Lin, Yu-Hsuan, Li-Ren Chang, Yang-Han Lee, Hsien-Wei Tseng, Terry BJ Kuo, and Sue-Huei Chen. 2014. Development and validation of the Smartphone Addiction Inventory (SPAI). *PloS One*, 9(6).
- Lindgren, Kristen P, Clayton Neighbors, Erin Westgate, and Elske Salemink. 2014. Self-control and Implicit Drinking Identity as Predictors of Alcohol Consumption, Problems, and Cravings. *Journal of Studies on Alcohol and Drugs*, 75(2), 290-298.
- Litman, Leib, Jonathan Robinson, and Tzvi Abberbock. 2017. TurkPrime. com: A versatile crowdsourcing data acquisition platform for the behavioral sciences. *Behavior Research Methods*, 49(2), 433-442.
- Liu, Timothy, and Marc N Potenza. 2010. Problematic Internet Use Clinical Aspects. *Impulse Control Disorders*, 167-181.

References

- Loid, Karina, Karin Täht, and Dmitri Rozgonjuk. 2020. Do Pop-up Notifications Regarding Smartphone Use Decrease Screen Time, Phone Checking Behavior, and Self-reported Problematic Smartphone Use? Evidence From a Two-month Experimental Study. *Computers in Human Behavior*, 102, 22-30.
- Macan, Therese Hoff. 1994. Time management: Test of a process model. *Journal of Applied Psychology*, 79(3), 381.
- Mai, Robert, Stefan Hoffmann, Wassili Lasarov, and Arne Buhs. 2017. Ethical Products= Less Strong: How Explicit and Implicit Reliance on the Lay Theory Affects Consumption Behaviors. *Journal of Business Ethics*, 1-19.
- Maison, Dominika, Anthony G Greenwald, and Ralph Bruin. 2001. The Implicit Association Test as a Measure of Implicit Consumer Attitudes. *Polish Psychological Bulletin*, 32(1), 1-9. doi: 10.1066/S10012010002
- Maison, Dominika, Anthony G Greenwald, and Ralph H Bruin. 2004. Predictive validity of the Implicit Association Test in studies of brands, consumer attitudes, and behavior. *Journal of Consumer Psychology*, 14(4), 405-415.
- Mak, Kwok-Kei, Ching-Man Lai, Chih-Hung Ko, Chien Chou, Dong-Il Kim, Hiroko Watanabe et al. 2014. Psychometric properties of the revised chen internet addiction scale (CIAS-R) in Chinese adolescents. *Journal of Abnormal Child Psychology*, 42(7), 1237-1245.
- Makin, Judy, Peter A Fried, and Barbara Watkinson. 1991. A comparison of active and passive smoking during pregnancy: long-term effects. *Neurotoxicology and teratology*, 13(1), 5-12.
- Marshall, Simon J, Trish Gorely, and Stuart JH Biddle. 2006. A Descriptive Epidemiology of Screen-based Media Use in Youth: a Review and Critique. *Journal of Adolescence*, 29(3), 333-349.

References

- Mattavelli, Simone, Aya Avishai, Marco Perugini, Juliette Richetin, and Paschal Sheeran. 2017. How Can Implicit and Explicit Attitudes Both Be Changed? Testing Two Interventions to Promote Consumption of Green Vegetables. *Annals of Behavioral Medicine*, 51(4), 511-518. doi: 10.1007/s12160-016-9874-9
- Maxwell, Nicholas. 2013. From Knowledge to Wisdom: Assessment and Prospects after Three Decades. *Integral Review*, 9(2), 76-112.
- McCrae, Robert R, and Paul T Costa. 1987. Validation of the five-factor model of personality across instruments and observers. *Journal of Personality and Social Psychology*, 52(1), 81.
- McDermott, Aoife, David Coghlan, and Mary A Keating. 2008. Research for Action and Research in Action: Processual and Action Research in Dialogue? *Irish Journal of Management*, 29(1).
- McMurrian, Robert C, and Erika Matulich. 2016. Building customer value and profitability with business ethics. *Journal of Business & Economics Research (JBER)*, 14(3), 83-90.
- Meerkerk, Gert-Jan. 2007. *Pwned by the Internet*: Erasmus University Rotterdam.
- Meier, Adrian, Leonard Reinecke, and Christine E Meltzer. 2016a. “Facebocrastination”? Predictors of using Facebook for procrastination and its effects on students’ well-being. *Computers in Human Behavior*, 64, 65-76.
- Meier, Madeline, Wayne Hall, Avshalom Caspi, Daniel W. Belsky, Magdalena Cerdá, HonaLee Harrington et al. 2016b. Which Adolescents Develop Persistent Substance Dependence in Adulthood? Using Population-representative Longitudinal Data to Inform Universal Risk Assessment. *Psychological Medicine*, 46(4), 877-889.

References

- Meissner, Franziska, and Klaus Rothermund. 2015. A thousand words are worth more than a picture? The effects of stimulus modality on the implicit association test. *Social Psychological and Personality Science*, 6(7), 740-748.
- Meshi, Dar, Anastassia Elizarova, Andrew Bender, and Antonio Verdejo-Garcia. 2019. Excessive social media users demonstrate impaired decision making in the Iowa Gambling Task. *Journal of Behavioral Addictions*, 8(1), 169-173.
- Meule, Adrian. 2013. Impulsivity and overeating: a closer look at the subscales of the Barratt Impulsiveness Scale. *Frontiers in psychology*, 4, 177.
- Mick, David Glen. 2006. Meaning and Mattering Through Transformative Consumer Research. *Advances in Consumer Research*, 33(1), 1-4.
- Mick, David Glen, Simone Pettigrew, Cornelia Pechmann, and Julie L. Ozanne (Eds.). (2011). *Transformative Consumer Research for Personal and Collective Well-Being*. New York, NY: Routledge.
- Mick, David Glen, and Barry Schwartz 2012. Can Consumers be Wise? Aristotle Speaks to the 21st Century. In D. G. Mick, S. Pettigrew, C. Pechmann & J. L. Ozanne (Eds.) *Transformative consumer research for personal and collective well-being*: (pp. 691-708). Routledge.
- millisecond.com. 2016. *IAT Score Cutoff*.
<https://www.millisecond.com/forums/Topic18492.aspx>
- Mischel, Walter. 1974. Processes in delay of gratification. *Advances in experimental social psychology*, 7, 249-292.
- Mishra, Arul, and Himanshu Mishra. 2010. We are what we consume: The influence of food consumption on impulsive choice. *Journal of Marketing Research*, 47(6), 1129-1137.
- Mitchell, Lewis, and Zaheer Hussain. 2018. Predictors of problematic smartphone use: an examination of the Integrative Pathways Model and the role of age, gender,

References

- impulsiveness, excessive reassurance seeking, extraversion, and depression. *Behavioral Sciences*, 8(8), 74.
- Moher, David, Alessandro Liberati, Jennifer Tetzlaff, and Douglas G Altman. 2009. Preferred reporting items for systematic reviews and meta-analyses: the PRISMA statement. *Annals of Internal Medicine*, 151(4), 264-269.
- Mond, Jonathan M, and Rachel M Calogero. 2009. Excessive exercise in eating disorder patients and in healthy women. *Australian and New Zealand Journal of Psychiatry*, 43(3), 227-234.
- Mond, Jonathan Matthew, Phillipa J Hay, Bryan Rodgers, C Owen, and PJV Beumont. 2004. Relationships between exercise behaviour, eating-disordered behaviour and quality of life in a community sample of women: when is exercise 'excessive'? *European Eating Disorders Review: The Professional Journal of the Eating Disorders Association*, 12(4), 265-272.
- Morrison, Catriona M, and Helen Gore. 2010. The Relationship Between Excessive Internet Use and Depression: a Questionnaire-based Study of 1,319 Young People and Adults. *Psychopathology*, 43(2), 121-126.
- MTurk. 2014. *About Screening Surveys*. <http://mturk101.blogspot.com/2014/05/about-screening-surveys.html>
- MTurk. 2018a. *After the Bot Scare: Understanding What's Been Happening with Data Collection on MTurk and How to Stop it*. <https://blog.turkprime.com/after-the-bot-scare-understanding-whats-been-happening-with-data-collection-on-mturk-and-how-to-stop-it>
- MTurk. 2018b. *Moving Beyond Bots: MTurk as a Source of High Quality Data*. <https://blog.turkprime.com/moving-beyond-bots-mturk-as-a-source-of-high-quality-data>

References

- Mudry, Tanya, David C Hodgins, Nady el-Guebaly, T Cameron Wild, Ian Colman, Scott B Patten et al. 2011. Conceptualizing Excessive Behaviour Syndromes: A Systematic Review. *Current Psychiatry Reviews*, 7(2), 138-151.
- Müller, KW, M Dreier, ME Beutel, and K Wölfling. 2016. Is Sensation Seeking a correlate of excessive behaviors and behavioral addictions? A detailed examination of patients with gambling disorder and internet addiction. *Psychiatry Research*, 242, 319-325.
- Muraven, Mark, and Roy F Baumeister. 2000. Self-regulation and Depletion of Limited Resources: Does Self-control Resemble a Muscle? *Psychological Bulletin*, 126(2), 247.
- Murdock Jr, Bennet B. 1960. The immediate retention of unrelated words. *Journal of Experimental Psychology*, 60(4), 222.
- Naslund, John A, Sunny Jung Kim, Kelly A Aschbrenner, Laura J McCulloch, Mary F Brunette, Jesse Dallery et al. 2017. Systematic review of social media interventions for smoking cessation. *Addictive Behaviors*, 73, 81-93.
- Naylor, Rebecca Walker, Cait Poynor Lamberton, and Patricia M West. 2012. Beyond the “like” button: The impact of mere virtual presence on brand evaluations and purchase intentions in social media settings. *Journal of Marketing*, 76(6), 105-120.
- Ngai, Eric WT, Spencer SC Tao, and Karen KL Moon. 2015. Social media research: Theories, constructs, and conceptual frameworks. *International Journal of Information Management*, 35(1), 33-44.
- NIAA. 2004. *NIAAA Newsletter, Winter 2004, Number 3, Department of health and human services*.
https://pubs.niaaa.nih.gov/publications/newsletter/winter2004/newsletter_number3.pdf

References

- Northcote, Jeremy, and Michael Livingston. 2011. Accuracy of self-reported drinking: observational verification of 'last occasion' drink estimates of young adults. *Alcohol and Alcoholism*, 46(6), 709-713.
- Nouchi, Rui, Yasuyuki Taki, Hikaru Takeuchi, Hiroshi Hashizume, Yuko Akitsuki, Yayoi Shigemune et al. 2012. Brain training game improves executive functions and processing speed in the elderly: a randomized controlled trial. *PloS One*, 7(1).
- O'Brien, Chris. 2020. *Nielsen: Total TV Shows and Movies Increased 10% in 2019 Thanks to Streaming Wars*. <https://venturebeat.com/2020/02/11/nielsen-total-tv-shows-and-movies-increased-10-in-2019-thanks-to-streaming-wars/>
- Olczak-Kowalczyk, Dorota, Jacek Tomczyk, Dariusz Gozdowski, and Urszula Kaczmarek. 2019. Excessive computer use as an oral health risk behaviour in 18-year-old youths from Poland: A cross-sectional study. *Clinical and Experimental Dental Research*.
- Olufadi, Yunusa. 2016. Social Networking Time Use Scale (SONTUS): A New Instrument for Measuring the Time Spent on the Social Networking Sites. *Telematics and Informatics*, 33(2), 452-471.
- Omar, B, and K Subramanian. 2013. Addicted to Facebook: Examining the roles of personality characteristics, gratifications sought and Facebook exposure among youths. *International Journal on Media & Communications*, 1, 54-65.
- Ong, Mohd Hanafi Azman, and Fadilah Puteh. 2017. Quantitative Data Analysis: Choosing Between SPSS, PLS and AMOS in Social Science Research. *International Interdisciplinary Journal of Scientific Research*, 3(1), 14-25.
- Orleans, C Tracy, Barbara K Rimer, Suzanne Cristinzio, Martha K Keintz, and Linda Fleisher. 1991. A national survey of older smokers: Treatment needs of a growing population. *Health Psychology*, 10(5), 343.

References

- Osatuyi, Babajide, and Ofir Turel. 2018. Tug of War Between Social Self-regulation and Habit: Explaining the Experience of Momentary Social Media Addiction Symptoms. *Computers in Human Behavior*, 85, 95-105.
- Ozanne, Julie L., David Glen Mick, Cornelia Pechmann, and Simone Pettigrew 2015. Transformative Consumer Research. *Wiley Encyclopedia of Management*: (pp.: John Wiley & Sons, Ltd.
- Ozanne, Julie, Simone Pettigrew, David Crockett, A. Fuat Firat, Hilary Downey, and Melanie Pescud. 2011. The Practice of Transformative Consumer Research -- Some Issues and Suggestions. *Journal of Research for Consumers*(19), 1-7.
- Özgülven, Nihan, and Burcu Mucan. 2013. The relationship between personality traits and social media use. *Social Behavior and Personality: an International Journal*, 41(3), 517-528.
- Palmgreen, Philip, and James D Rayburn. 1982. Gratifications sought and media exposure an expectancy value model. *Communication Research*, 9(4), 561-580.
- Panek, Elliot. 2014. Left to their own devices: College students' "guilty pleasure" media use and time management. *Communication Research*, 41(4), 561-577.
- Parkinson, Joy, Rebekah Russell-Bennett, and Josephine Previte. 2018. Challenging the planned behavior approach in social marketing: emotion and experience matter. *European Journal of Marketing*.
- Parkinson, Joy, Lisa Schuster, Rory Mulcahy, and Heini Maarit Taiminen. 2017. Online support for vulnerable consumers: a safe place? *Journal of Services Marketing*.
- Payne, B Keith, Clara Michelle Cheng, Olesya Govorun, and Brandon D Stewart. 2005. An inkblot for attitudes: affect misattribution as implicit measurement. *Journal of Personality and Social Psychology*, 89(3), 277.

References

- Pelling, Emma L, and Katherine M White. 2009. The theory of planned behavior applied to young people's use of social networking web sites. *CyberPsychology & Behavior*, 12(6), 755-759.
- Peluso, Marco Aurélio Monteiro, and Laura Helena Silveira Guerra de Andrade. 2005. Physical activity and mental health: the association between exercise and mood. *Clinics*, 60(1), 61-70.
- Peter, J Paul. 1992. Realism or relativism for marketing theory and research: a comment on Hunt's "Scientific Realism". *Journal of Marketing*, 56(2), 72-79.
- Peterson, Mark. 2010. Massively multiplayer online role-playing games as arenas for second language learning. *Computer Assisted Language Learning*, 23(5), 429-439.
- Petri, Grischka. 2014. The public domain vs. the museum: The limits of copyright and reproductions of two-dimensional works of art. *Journal of Conservation and Museum Studies*, 12(1), 8.
- Pies, Ronald. 2009. Should DSM-V Designate "Internet Addiction" a Mental Disorder? *Psychiatry (Edgmont)*, 6(2), 31-37.
- Podsakoff, Philip M, Scott B MacKenzie, Jeong-Yeon Lee, and Nathan P Podsakoff. 2003. Common Method Biases in Behavioral Research: A Critical Review of the Literature and Recommended Remedies. *Journal of Applied Psychology*, 88(5), 879.
- Pogacar, Ruth, Thomas P Carpenter, C Shenk, and Michal Kouril 2019. Tools and methods for measuring implicit consumer cognition. In F. R. Kardes, P. M. Herr & N. Schwarz (Eds.) *Handbook of Research Methods in Consumer Psychology*: (pp. New York: Routledge.
- Polites, Greta L, Christina Serrano, Jason Bennett Thatcher, and Kevin Matthews. 2018. Understanding social networking site (SNS) identity from a dual systems

References

- perspective: an investigation of the dark side of SNS use. *European Journal of Information Systems*, 27(5), 600-621.
- Pontes, Halley M, Daria J Kuss, and Mark D Griffiths. 2015a. Clinical psychology of Internet addiction: a review of its conceptualization, prevalence, neuronal processes, and implications for treatment. *Neuroscience & Neuroeconomics*, 4, 11-23.
- Pontes, Halley M, Attila Szabo, and Mark D Griffiths. 2015b. The impact of Internet-based specific activities on the perceptions of Internet addiction, quality of life, and excessive usage: A cross-sectional study. *Addictive Behaviors Reports*, 1, 19-25.
- Pornsakulvanich, Vikanda, Paul Haridakis, and Alan M Rubin. 2008. The influence of dispositions and Internet motivation on online communication satisfaction and relationship closeness. *Computers in Human Behavior*, 24(5), 2292-2310.
- Poulton, Richie. 2019. *The Dunedin Study: Dunedin multidisciplinary health and development unit*. <https://dunedinstudy.otago.ac.nz/>
- Poulton, Richie, Terrie E Moffitt, and Phil A Silva. 2015. The Dunedin Multidisciplinary Health and Development Study: overview of the first 40 years, with an eye to the future. *Social Psychiatry and Psychiatric Epidemiology*, 50(5), 679-693.
- Power, Sally, Chris Taylor, and Kim Horton. 2017. Sleepless in School? The Social Dimensions of Young People's Bedtime Rest and Routines. *Journal of Youth Studies*, 20(8), 945-958. doi: 10.1080/13676261.2016.1273522
- psychologicalscience.org. 2018. *Researchers Investigate Problems with MTurk Data*. <https://www.psychologicalscience.org/publications/observer/obsonline/researchers-investigate-problems-with-mturk-data.html>

References

- Punj, Girish, and David W Stewart. 1983. Cluster Analysis in Marketing Research: Review and Suggestions for Application. *Journal of Marketing Research*, 20(2), 134-148.
- Quan-Haase, Anabel, and Alyson L Young. 2010. Uses and gratifications of social media: A comparison of Facebook and instant messaging. *Bulletin of Science, Technology & Society*, 30(5), 350-361.
- Quora. 2018. *Alternative naming conventions for a "news feed"*.
<https://www.quora.com/What-are-some-alternative-naming-conventions-for-a-news-feed>
- Rachlin, Howard. 2000. *The Science of Self-control*: Harvard University Press.
- Radovic, Ana, Theresa Gmelin, Bradley D Stein, and Elizabeth Miller. 2017. Depressed adolescents' positive and negative use of social media. *Journal of Adolescence*, 55, 5-15.
- Rauthmann, John F. 2017. Development of implicit personality. *Personality Development Across the Lifespan*, 537-554.
- Raylu, Namrata, and Tian PS Oei. 2002. Pathological gambling: A comprehensive review. *Clinical Psychology Review*, 22(7), 1009-1061.
- Rezaei, Ali R. 2011. Validity and reliability of the IAT: Measuring gender and ethnic stereotypes. *Computers in Human Behavior*, 27(5), 1937-1941.
- Rice, Ronald E, and Ingunn Hagen. 2010. Young Adults' Perpetual Contact, Social Connectivity, and Social Control Through the Internet and Mobile Phones. *Annals of the International Communication Association*, 34(1), 3-39.
- Ringle, Christian M, Sven Wende, and Jan-Michael Becker. 2015. SmartPLS 3. SmartPLS GmbH, Boenningstedt. *Journal of Service Science and Management* 10(3).

References

- Robertson, Lindsay, Ella Iosua, Rob McGee, and Robert J Hancox. 2015. Nondaily, Low-rate Daily, and High-rate Daily Smoking in Young Adults: a 17-year Follow-up. *Nicotine & Tobacco Research*, 18(5), 943-949.
- Robinson, T. E., and K. C. Berridge. 2001. Incentive-sensitization and Addiction. *Addiction* 96(1), 103-114. doi: 10.1046/j.1360-0443.2001.9611038.x
- Roldán, José L, and Manuel J Sánchez-Franco 2012. Variance-based structural equation modeling: guidelines for using partial least squares in information systems research. In A. Steenkamp & M. S. Raisinghani (Eds.) *Research Methodologies, Innovations and Philosophies in Software Systems Engineering and Information systems*: (pp. 193-221). IGI Global.
- Román, Sergio, and Pedro J. Cuestas. 2008. The Perceptions of Consumers Regarding Online Retailers' Ethics and Their Relationship with Consumers' General Internet Expertise and Word of Mouth: A Preliminary Analysis. *Journal of Business Ethics*, 83(4), 641-656. doi: 10.1007/s10551-007-9645-4
- Rosenberg, Morris. 1989. *Society and the Adolescent Self-image. Revised edition*: Middletown, CT: Wesleyan University Press.
- Ross, Craig, Emily S. Orr, Mia Sisic, Jaime M. Arseneault, Mary G. Simmering, and R. Robert Orr. 2009. Personality and Motivations Associated with Facebook Use. *Computers in Human Behavior*, 25(2), 578-586. doi: <https://doi.org/10.1016/j.chb.2008.12.024>
- Rotter, Julian B. 1966. Generalized expectancies for internal versus external control of reinforcement. *Psychological Monographs: General and Applied*, 80(1), 1.
- rstudio.com. 2019 <https://www.rstudio.com/>
- Rundle-Thiele, Sharyn, Krzysztof Kubacki, Aaron Tkaczynski, and Joy Parkinson. 2015. Using Two-step Cluster Analysis to Identify Homogeneous Physical Activity Groups. *Marketing Intelligence & Planning*, 522-537.

References

Ryan, T. J. 2018. *Data Contamination on MTurk*.

<http://timryan.web.unc.edu/2018/08/12/data-contamination-on-mturk/>

Rydell, Robert J., and Allen R. McConnell. 2006. Understanding implicit and explicit attitude change: A systems of reasoning analysis. *Journal of Personality and Social Psychology*, 91(6), 995-1008. doi: 10.1037/0022-3514.91.6.995

Ryu, Dongwan. 2013. Play to learn, learn to play: Language learning through gaming culture. *ReCALL*, 25(2), 286-301.

Sagioglou, Christina, and Tobias Greitemeyer. 2014. Facebook's Emotional Consequences: Why Facebook Causes a Decrease in Mood and Why People Still Use it. *Computers in Human Behavior*, 35, 359-363. doi: <https://doi.org/10.1016/j.chb.2014.03.003>

Salehan, Mohammad, and Arash Negahban. 2013. Social networking on smartphones: When mobile phones become addictive. *Computers in Human Behavior*, 29(6), 2632-2639.

Salim, Saima. 2019. *How much time do you spend on social media? Research says 142 minutes per day*. <https://www.digitalinformationworld.com/2019/01/how-much-time-do-people-spend-social-media-infographic.html>

Salmon, Stefanie J, Marieke A Adriaanse, Emely De Vet, Bob M Fennis, and Denise TD De Ridder. 2014. "When the going gets tough, who keeps going?" Depletion sensitivity moderates the ego-depletion effect. *Frontiers in Psychology*, 5, 647.

Sampasa-Kanyinga, Hugues, and Rosamund F Lewis. 2015. Frequent Use of Social Networking Sites is Associated with Poor Psychological Functioning Among Children and Adolescents. *Cyberpsychology, Behavior, and Social Networking*, 18(7), 380-385.

References

- Sayette, Michael A, Saul Shiffman, Stephen T Tiffany, Raymond S Niaura, Christopher S Martin, and William G Schadel. 2000. The measurement of drug craving. *Addiction*, 95(8s2), 189-210.
- Schmidt, Marie Evans, Jess Haines, Ashley O'brien, Julia McDonald, Sarah Price, Bettylou Sherry et al. 2012. Systematic Review of Effective Strategies for Reducing Screen Time Among Young Children. *Obesity*, 20(7), 1338-1354.
- Schmukle, Stefan C., and Boris Egloff. 2005. A Latent State-Trait Analysis of Implicit and Explicit Personality Measures. *European Journal of Psychological Assessment*, 21(2), 100-107. doi: 10.1027/1015-5759.21.2.100
- Schneider, David J. 1973. Implicit personality theory: A review. *Psychological Bulletin*, 79(5), 294.
- Seay, A Fleming, and Robert E Kraut. (2007). *Project massive: Self-regulation and problematic use of online gaming*. Paper presented at the Proceedings of the SIGCHI conference on Human factors in computing systems.
- Sengupta, Jaideep, and Rongrong Zhou. 2007. Understanding Impulsive Eaters' Choice Behaviors: The Motivational Influences of Regulatory Focus. *Journal of Marketing Research*, 44(2), 297-308.
- Serino, Maeve, Kyla Cordrey, Laura McLaughlin, and Ruth L Milanaik. 2016. Pokémon Go and augmented virtual reality games: a cautionary commentary for parents and pediatricians. *Current Opinion in Pediatrics*, 28(5), 673-677.
- Seymour, Richard. 2019. *The Machine Always Wins: What Drives our Addiction to Social Media*. <https://www.theguardian.com/technology/2019/aug/23/social-media-addiction-gambling>
- Shapira, Nathan A, Mary C Lessig, Toby D Goldsmith, Steven T Szabo, Martin Lazoritz, Mark S Gold et al. 2003. Problematic Internet Use: Proposed Classification and Diagnostic Criteria. *Depression and Anxiety*, 17(4), 207-216.

References

- Sharwood. 2017. *Pokémon GO caused hundreds of deaths, increased crashes.*
https://www.theregister.co.uk/2017/11/27/pokemon_go_caused_car_accidents_and_deaths/
- Shiv, Baba, and Alexander Fedorikhin. 1999. Heart and mind in conflict: The interplay of affect and cognition in consumer decision making. *Journal of Consumer Research*, 26(3), 278-292.
- Shonin, Edo, William Van Gordon, and Mark D Griffiths. 2014. Mindfulness and the social media. *Journal of Mass Communication & Journalism*, 4(5).
- Siemieniako, Dariusz, and Krzysztof Kubacki. 2011. Exploring college students' perceptions of negative consequences of binge drinking through consumer collages. *ACR European Advances*, 255-263.
- Siemieniako, Dariusz, Sharyn Rundle-Thiele, and Krzysztof Kubacki. 2010. Exploring locality and college binge drinking: a Polish and Canadian perspective. *Young Consumers*, 11(4).
- Sigerson, Leif, Angel Y-L Li, Mike W-L Cheung, and Cecilia Cheng. 2017. Examining Common Information Technology Addictions and Their Relationships with Non-Technology-Related Addictions. *Computers in Human Behavior*, 75, 520-526.
- Singh, Jatinder J., Oriol Iglesias, and Joan Manel Batista-Foguet. 2012. Does Having an Ethical Brand Matter? The Influence of Consumer Perceived Ethicality on Trust, Affect and Loyalty. *Journal of Business Ethics*, 111(4), 541-549. doi: 10.1007/s10551-012-1216-7
- Skinner, Harvey A, and Barbara A Allen. 1982. Alcohol dependence syndrome: measurement and validation. *Journal of Abnormal Psychology*, 91(3), 199.
- Sobh, Rana, and Chad Perry. 2006. Research design and data analysis in realism research. *European Journal of marketing*.

References

- Solon, Olivia. 2017. *Ex-Facebook President Sean Parker: Site Made to Exploit Human 'Vulnerability'*.
<https://www.theguardian.com/technology/2017/nov/09/facebook-sean-parker-vulnerability-brain-psychology>
- Spears, Dean. 2011. Economic Decision-Making in Poverty Depletes Behavioral Control. *The BE Journal of Economic Analysis & Policy*, 11(1).
- Spector, Paul E. 2019. Do Not Cross Me: Optimizing the Use of Cross-Sectional Designs. *Journal of Business and Psychology*, 34(2), 125-137.
- Spilkova, Jana, Pavla Chomynova, and Ladislav Csemy. 2017. Predictors of excessive use of social media and excessive online gaming in Czech teenagers. *Journal of Behavioral Addictions*, 6(4), 611-619.
- Sriwilai, Kanokporn, and Peerayuth Charoensukmongkol. 2016. Face it, don't Facebook it: Impacts of Social Media Addiction on Mindfulness, Coping Strategies and the Consequence on Emotional Exhaustion. *Stress and Health*, 32(4), 427-434.
doi: 10.1002/smi.2637
- Statista.com. 2020a. *Number of monthly active Facebook users worldwide as of 1st quarter 2020*. <https://www.statista.com/statistics/264810/number-of-monthly-active-facebook-users-worldwide/>
- Statista.com. 2020b. *Number of monthly active Facebook users worldwide as of 4th quarter 2019*. <https://www.statista.com/statistics/264810/number-of-monthly-active-facebook-users-worldwide/>
- Statistic, U.S.Bureau of Labour. 2018. *Time Spent in Primary Activities and Percent of the Civilian Population Engaging in Each Activity*.
<https://www.bls.gov/news.release/atus.t01.htm>

References

- stats.govt.nz. 2019. *Classifications and related statistical standards*.
<http://archive.stats.govt.nz/methods/classifications-and-standards/classification-related-stats-standards.aspx>
- Steel, Piers. 2007. The nature of procrastination: A meta-analytic and theoretical review of quintessential self-regulatory failure. *Psychological Bulletin*, 133(1), 65.
- Steffens, Melanie C., and Axel Buchner. 2003. Implicit Association Test: Separating Transsituationally Stable and Variable Components of Attitudes Toward Gay Men. *Experimental Psychology*, 50(1), 33-48. doi: 10.1027//1618-3169.50.1.33
- Stieger, Stefan, and David Lewetz. 2018. A week without using social media: Results from an ecological momentary intervention study using smartphones. *Cyberpsychology, Behavior, and Social Networking*, 21(10), 618-624.
- Strack, Fritz, and Roland Deutsch. 2004. Reflective and Impulsive Determinants of Social Behavior. *Personality and Social Psychology Review*, 8(3), 220-247. doi: 10.1207/s15327957pspr0803_1
- Strack, Fritz, and Roland Deutsch. 2015. The Duality of Everyday Life: Dual-process and Dual System Models in Social Psychology. *Attitudes and Social Cognition*, 1, 891-927.
- Strimas, Rachel, Caroline Davis, Karen Patte, Claire Curtis, Caroline Reid, and Catherine McCool. 2008. Symptoms of attention-deficit/hyperactivity disorder, overeating, and body mass index in men. *Eating behaviors*, 9(4), 516-518.
- Stryker, Sheldon. 1968. Identity salience and role performance: The relevance of symbolic interaction theory for family research. *Journal of Marriage and the Family*, 558-564.
- Sublette, Victoria Anne, and Barbara Mullan. 2012. Consequences of play: A systematic review of the effects of online gaming. *International Journal of Mental Health and Addiction*, 10(1), 3-23.

References

- Sussman, Steve, and Meghan B Moran. 2013. Hidden Addiction: Television. *Journal of Behavioral Addictions*, 2(3), 125-132.
- Talukdar, Debabrata, and Charles Lindsey. 2013. To buy or not to buy: Consumers' demand response patterns for healthy versus unhealthy food. *Journal of Marketing*, 77(2), 124-138.
- Tan, Tina, Angeline Kuek, Shih Ee Goh, Ee Lian Lee, and Victor Kwok. 2016. Internet and Smartphone Application Usage in Eating Disorders: A Descriptive Study in Singapore. *Asian Journal of Psychiatry*, 19, 50-55.
- Tangney, June P., Roy F. Baumeister, and Angie Luzio Boone. 2004. High Self-Control Predicts Good Adjustment, Less Pathology, Better Grades, and Interpersonal Success. *Journal of Personality*, 72(2), 271-324. doi: 10.1111/j.0022-3506.2004.00263.x
- Tao, Ran, Xiuqin Huang, Jinan Wang, Huimin Zhang, Ying Zhang, and Mengchen Li. 2010. Proposed diagnostic criteria for internet addiction. *Addiction*, 105(3), 556-564.
- Taylor, Claire. 2001. The Relationship Between Social and Self-control: Tracing Hirschi's Criminological Career. *Theoretical Criminology*, 5(3), 369-388.
- Tazawa, Yusaku, and Kyoji Okada. 2001. Physical signs associated with excessive television-game playing and sleep deprivation. *Pediatrics International*, 43(6), 647-650.
- Terry, Deborah J, Michael A Hogg, and Katherine M White. 1999. The theory of planned behaviour: self-identity, social identity and group norms. *British Journal of Social Psychology*, 38(3), 225-244.
- Thaler, Richard H, and Hersh M Shefrin. 1981. An Economic Theory of Self-control. *Journal of Political Economy*, 89(2), 392-406.

References

- Thomas, BH, Donna Ciliska, Maureen Dobbins, and S Micucci. 2004. A process for systematically reviewing the literature: providing the research evidence for public health nursing interventions. *Worldviews on Evidence-Based Nursing*, 1(3), 176-184.
- Thompson, Sharon H, and Eric Lougheed. 2012. Frazzled by Facebook? An Exploratory Study of Gender Differences in Social Network Communication Among Undergraduate Men and Women. *College Student Journal*, 46(1), 88-99.
- Tiffany, Stephen T, and David J Drobes. 1991. The development and initial validation of a questionnaire on smoking urges. *British Journal of Addiction*, 86(11), 1467-1476.
- Tiku, Nitasha. 2018. *The Wired Guide to Internet Addiction*.
<https://www.wired.com/story/wired-guide-to-internet-addiction/>
- Toda, Masahiro, Kazuyuki Monden, Kazuki Kubo, and Kanehisa Morimoto. 2004. Cellular phone dependence tendency of female university students. *Nippon Eiseigaku Zasshi (Japanese Journal of Hygiene)*, 59(4), 383-386.
- Tomko, Rachel L, Marika B Solhan, Ryan W Carpenter, Whitney C Brown, Seungmin Jahng, Phillip K Wood et al. 2014. Measuring Impulsivity in Daily Life: the Momentary Impulsivity Scale. *Psychological Assessment*, 26(2), 339.
- Tran, T. B. (2012). *Rumination and emotional adjustment: The role of social networking sites*. ProQuest Dissertations & Theses A&I. Retrieved from <http://search.proquest.com.ezproxy.canterbury.ac.nz/docview/1095536740?accountid=14499>
- Trevisan, Enrico. 2016. *The Irrational Consumer: Applying Behavioural Economics to Your Business Strategy*: Routledge.

References

- Tsitsika, Artemis, Elena Critselis, Mari Janikian, George Kormas, and Dimitrios A Kafetzis. 2011. Association between internet gambling and problematic internet use among adolescents. *Journal of Gambling Studies*, 27(3), 389-400.
- Tuk, Mirjam A, Kuangjie Zhang, and Steven Sweldens. 2015. The Propagation of Self-control: Self-control in One Domain Simultaneously Improves Self-control in Other Domains. *Journal of Experimental Psychology: General*, 144(3), 639.
- Turel, Ofir. 2015. Quitting the use of a habituated hedonic information system: a theoretical model and empirical examination of Facebook users. *European Journal of Information Systems*, 24(4), 431-446.
- Turel, Ofir, and Antoine Bechara. 2016. A Triadic Reflective-Impulsive-Interoceptive Awareness Model of General and Impulsive Information System Use: Behavioral Tests of Neuro-Cognitive Theory. *Frontiers in Psychology*, 7, 601.
- Turel, Ofir, Qinghua He, Gui Xue, Lin Xiao, and Antoine Bechara. 2014. Examination of Neural Systems Sub-serving Facebook “Addiction”. *Psychological Reports*, 115(3), 675-695.
- Turel, Ofir, and Hamed Qahri-Saremi. 2016. Problematic Use of Social Networking Sites: Antecedents and Consequence from a Dual-System Theory Perspective. *Journal of Management Information Systems*, 33(4), 1087-1116. doi: 10.1080/07421222.2016.1267529
- Turel, Ofir, and Hamed Qahri-Saremi. 2017. Explaining Unplanned Online Media Behaviors: Dual System Theory Models of Impulsive Use and Swearing on Social Networking Sites. *New Media & Society*, 0(0), 1461444817740755. doi: 10.1177/1461444817740755
- TurkPrime. 2018a. *Are MTurk workers who they say they are?*
<https://blog.turkprime.com/are-mturk-workers-who-they-say-they-are>

References

- TurkPrime. 2018b. *Concerns about Bots on Mechanical Turk: Problems and Solutions*.
<https://blog.turkprime.com/concerns-about-bots-on-mechanical-turk-problems-and-solutions>
- TurkPrime. 2018c. *TurkPrime's Powerful Mechanical Turk Toolkit*.
<https://www.turkprime.com/Service/MturkToolkit?hsCtaTracking=b485a6c4-f5b2-40bc-8536-f2473c24a556%7C0a16edbc-9920-4fcb-a850-9e422648d4a4>
- TurkPrime. 2018d. *TurkPrime Tools to Help Combat Responses from Suspicious Geolocations*. <https://blog.turkprime.com/turkprime-tools-to-help-combat-responses-from-suspicious-geolocations>
- Valkenburg, Patti M., Jochen Peter, and Alexander P. Schouten. 2006. Friend Networking Sites and Their Relationship to Adolescents' Well-Being and Social Self-Esteem. *CyberPsychology & Behavior*, 9(5), 584-590. doi: 10.1089/cpb.2006.9.584
- Van Koningsbruggen, Guido M, Tilo Hartmann, Allison Eden, and Harm Veling. 2017. Spontaneous hedonic reactions to social media cues. *Cyberpsychology, Behavior, and Social Networking*, 20(5), 334-340.
- vangoghmuseum.nl. 2019. *Use and Permissions of Collection Images*.
<https://www.vangoghmuseum.nl/en/organisation/conditions-use-and-permissions-of-images>
- Vargas, Teresa, Jacqueline Maloney, Tina Gupta, Katherine SF Damme, Nicholas J Kelley, and Vijay A Mittal. 2019. Measuring facets of reward sensitivity, inhibition, and impulse control in individuals with problematic Internet use. *Psychiatry Research*, 275, 351-358.
- Veer, Ekant. 2011. Being online: how the Internet is changing research for consumers. *Journal of Research for Consumers*(20), 1-6.

References

- Verduyn, P., O. Ybarra, M. Résibois, J. Jonides, and E. Kross. 2017. Do Social Network Sites Enhance or Undermine Subjective Well-Being? A Critical Review. *Social Issues and Policy Review*, 11(1), 274-302. doi: 10.1111/sipr.12033
- Verplanken, Bas, Henk Aarts, and Ad Van Knippenberg. 1997. Habit, information acquisition, and the process of making travel mode choices. *European Journal of Social Psychology*, 27(5), 539-560.
- Verplanken, Bas, Astrid G Herabadi, Judith A Perry, and David H Silvera. 2005. Consumer style and health: The role of impulsive buying in unhealthy eating. *Psychology & Health*, 20(4), 429-441.
- Verplanken, Bas, and Sheina Orbell. 2003. Reflections on past behavior: a self-report index of habit strength 1. *Journal of Applied Social Psychology*, 33(6), 1313-1330.
- Verplanken, Bas, and Ayana Sato. 2011. The psychology of impulse buying: An integrative self-regulation approach. *Journal of Consumer Policy*, 34(2), 197-210.
- Vohs, Kathleen D, and Todd F Heatherton. 2000. Self-regulatory failure: A resource-depletion approach. *Psychological Science*, 11(3), 249-254.
- Volkow, Nora D., George F. Koob, and A. Thomas McLellan. 2016. Neurobiologic Advances from the Brain Disease Model of Addiction. *New England Journal of Medicine*, 374(4), 363-371. doi: 10.1056/NEJMr1511480
- Vondráčková, Petra, and Roman Gabrhelik. 2016. Prevention of Internet addiction: A systematic review. *Journal of Behavioral Addictions*, 5(4), 568-579.
- Vuchinich, Rudy E, and Nick Heather. 2003. *Choice, Behavioral Economics, and Addiction*: Elsevier.

References

- Wagner-Greene, Victoria R, Amy J Wotring, Thomas Castor, Jessica Kruger, Sarah Mortemore, and Joseph A Dake. 2017. Pokémon GO: Healthy or harmful? *American Journal of Public Health*, 107(1), 35.
- Wallace, PG, and A Haines. 1985. Use of a questionnaire in general practice to increase the recognition of patients with excessive alcohol consumption. *British Medical Journal*, 290(6486), 1949-1953.
- Walsh, Shari P, Katherine Marie White, and Ross McD Young. 2010. Needing to connect: The effect of self and others on young people's involvement with their mobile phones. *Australian Journal of Psychology*, 62(4), 194-203.
- Wang, Amy B. 2017. *Former Facebook VP says social media is destroying society with 'dopamine-driven feedback loops'*. <https://www.washingtonpost.com/news/the-switch/wp/2017/12/12/former-facebook-vp-says-social-media-is-destroying-society-with-dopamine-driven-feedback-loops/>
- Wang, Pengcheng, Xingchao Wang, Jia Nie, Pan Zeng, Ke Liu, Jiayi Wang et al. 2019. Envy and problematic smartphone use: The mediating role of FOMO and the moderating role of student-student relationship. *Personality and Individual Differences*, 146, 136-142.
- Ward, Adrian F, Kristen Duke, Ayelet Gneezy, and Maarten W Bos. 2017. Brain Drain: the Mere Presence of One's Own Smartphone Reduces Available Cognitive Capacity. *Journal of the Association for Consumer Research*, 2(2), 140-154.
- Wardle, Jane. 1990. Conditioning processes and cue exposure in the modification of excessive eating. *Addictive Behaviors*, 15(4), 387-393.
- Wearesocial.com. 2019. *Digital 2019: Q4 Global Digital Statshot*. <https://wearesocial.com/blog/2019/10/the-global-state-of-digital-in-october-2019>

References

- Wechsler, Henry, and Toben F Nelson. 2008. What we have learned from the Harvard School of Public Health College Alcohol Study: Focusing attention on college student alcohol consumption and the environmental conditions that promote it. *Journal of Studies on alcohol and Drugs*, 69(4), 481-490.
- Weinstein, Aviv, and Michel Lejoyeux. 2010. Internet addiction or excessive internet use. *The American Journal of Drug and Alcohol Abuse*, 36(5), 277-283.
- Weinstein, Emily. 2018. The social media see-saw: Positive and negative influences on adolescents' affective well-being. *New Media & Society*, 20(10), 3597-3623.
- Westerman, David, Patric R Spence, and Brandon Van Der Heide. 2014. Social Media as Information Source: Recency of Updates and Credibility of Information. *Journal of Computer-Mediated Communication*, 19(2), 171-183.
- Whelan, Eoin, AKM Najmul Islam, and Stoney Brooks. 2020. Applying the SOBC paradigm to explain how social media overload affects academic performance. *Computers & Education*, 143, 103692.
- White, Aaron, and Ralph Hingson. 2013. The burden of alcohol use: excessive alcohol consumption and related consequences among college students. *Alcohol Research: Current Reviews*.
- White, Aaron M, Courtney L Kraus, Julie D Flom, Lori A Kestenbaum, Jamie R Mitchell, Kunal Shah et al. 2005. College students lack knowledge of standard drink volumes: implications for definitions of risky drinking based on survey data. *Alcoholism: Clinical and Experimental Research*, 29(4), 631-638.
- Wiener, Norbert. 1954. *The Human Use of Human Beings* (Vol. 3): Houghton Mifflin.
- Wilcox, Keith, and Andrew T. Stephen. 2013. Are Close Friends the Enemy? Online Social Networks, Self-Esteem, and Self-Control. *Journal of Consumer Research*, 40(1), 90-103.

References

- Williams, Dmitri, Nick Yee, and Scott E Caplan. 2008. Who plays, how much, and why? Debunking the stereotypical gamer profile. *Journal of Computer-mediated Communication*, 13(4), 993-1018.
- Wills, Thomas A, Michael G Ainette, Mike Stoolmiller, Frederick X Gibbons, and Ori Shinar. 2008. Good Self-control as a Buffering Agent for Adolescent Substance Use: An Investigation in Early Adolescence with Time-varying Covariates. *Psychology of Addictive Behaviors*, 22(4), 459.
- Wills, Thomas A., Frederick X. Gibbons, James D. Sargent, Meg Gerrard, Hye-Ryeon Lee, and Sonya Dal Cin. 2010. Good Self-control Moderates the Effect of Mass Media on Adolescent Tobacco and Alcohol Use: Tests with Studies of Children and Adolescents. *Health Psychology*, 29(5), 539-549. doi: 10.1037/a0020818
- Wilson, Timothy D., Samuel Lindsey, and Tonya Y. Schooler. 2000. A Model of Dual Attitudes. *Psychological Review*, 107(1), 101-126.
- Woods, Heather Cleland, and Holly Scott. 2016. #Sleepyteens: Social media use in adolescence is associated with poor sleep quality, anxiety, depression and low self-esteem. *Journal of Adolescence*, 51, 41-49. doi: 10.1016/j.adolescence.2016.05.008
- Young, Kimberly. 2009. Internet Addiction: Diagnosis and Treatment Considerations. *Journal of Contemporary Psychotherapy*, 39(4), 241-246. doi: 10.1007/s10879-009-9120-x
- Young, Kimberly S. 1998. Internet Addiction: The Emergence of a New Clinical Disorder. *CyberPsychology & Behavior*, 1(3), 237-244. doi: 10.1089/cpb.1998.1.237
- Young, R McDonald, and Tian Po S Oei. 1996. *Drinking expectancy profile: a test manual*: Brisbane, QLD, Australia.

References

- Yu, Lingling, Xiongfei Cao, Zhiying Liu, and Junkai Wang. 2018. Excessive social media use at work: exploring the effects of social media overload on job performance. *Information Technology & People*, 31(6), 1091-1112.
- Zendle, David, and Henrietta Bowden-Jones. 2019. Is excessive use of social media an addiction? : British Medical Journal Publishing Group.
- Zimmerman, Barry J 2000. Attaining self-regulation: A social cognitive perspective. In K. D. Vohs & R. F. Baumeister (Eds.) *Handbook of self-regulation*: (pp. 13-39). Elsevier.

Appendices

Appendix 1: Study One. Review of Current Self-control Theoretical Frameworks for Social Media Context

Author(s)/ Year	Objectives	Term used	Theoretical framework			Findings on self-control	Contradiction between intentions and behaviour
			Theories of planned behaviour	Motivation and identity theories	Self-control theories		
Pelling and White (2009)	To predict high-level social media use by drawing on the extended theory of planned behaviour (TPB).	Perceived behavioural control (PBC)	TPB (Ajzen 1991; Terry et al. 1999)	Identity Theory (Stryker 1968) Self-identity and Social Identity Frameworks (Terry et al. 1999)		TPB was partially supported for the social media context. However, contrary to predictions, PBC was not a significant predictor of both intentions and behaviour. Meanwhile, self-identity significantly predicted the intention and behaviour.	✓
Baker and White (2010)	To test an extended TPB model to predict frequent social media use.	PBC	TPB (Ajzen 1991)	Social Identity Theory (Abrams and Hogg 1990) Self-esteem Framework (Rosenberg 1989)		PBC and group norms emerged as significant predictors of intention towards social media use. The intention, in turn, predicted behaviour. However, self-esteem did not show significant relationship with the intention.	

Omar and Subramani an (2013)	To define factors that contribute to Facebook addiction by drawing on Uses and Gratifications theory and Locus of Control	Internal control	Uses and Gratifications Theory (Katz et al. 1973)	Locus of Control (Rotter 1966)	Internal control was interpreted as one of conditions of locus of control, or as an extent to which individuals control own life. Internal control was not a significant predictor of Facebook addiction in contrast to gratifications sought and personality characteristics.	✓
Wilcox and Stephen (2013)	To explore the impact of self-esteem on the level of self-control on social media use	Self-control	Self-awareness and Self-esteem Framework (Gonzales and Hancock 2010)	Strength Model of Self-control (Tangney et al. 2004; Vohs and Heatherton 2000)	Self-control on social media was interpreted as a balance between the individual control, self-esteem and situational factors. The higher level of social media use was associated with higher self-esteem, poorer self-control and problems for the well-being.	✓
Panek (2014)	To explore the connection between the level of self-control and social media use in favour of immediate gratifications.	Self-control	Framework of “guilty pleasures” (Shiv and Fedorikhin 1999)	Strength Model of Self-control (Baumeister et al. 2007; Tangney et al. 2004) Time Inconsistent Preferences Framework (Hoch and Loewenstein 1991)	Self-control was conceptualised as a power to deactivate a desire for immediate “guilty” pleasures in favour of long-term benefits. The level of self-control was a more accurate predictor of social media use than self-reported reasoning.	✓

Błachnio and Przepiorka (2016)	To explore the connection between insufficient self-control and self-regulation with the Facebook addiction	Self-control; Self-regulation		Strength Model of Self-control (Baumeister et al. 2007; Muraven and Baumeister 2000) Self-regulation Framework (Zimmerman 2000)	Framework of Action – State Orientation (Kuhl 1981)	Self-control was interpreted as a skill to control personal behaviour while self-regulation as a process of managing thoughts, emotions and behaviour to achieve goals. The association between insufficient self-control and self-regulation on social media was confirmed. Users who were able to resist an impulse or temptation were less likely to develop Facebook addiction.	✓
Meier et al. (2016a)	To explore predictors of using Facebook for procrastination	Self-control	Uses and Gratifications Theory (Katz et al. 1973; Quan-Haase and Young 2010)	Strength Model of Self-control (Baumeister et al. 2007; Hofmann et al. 2012) Procrastination Framework (Steel 2007)	Dual-system Perspective (Hofmann et al. 2009)	Low trait self-control and habitual Facebook checking were predictors of using Facebook for procrastination. Procrastination is interpreted as an irrational delay of important tasks with negative effects for the well-being.	✓
Turel et al (2016)	To explore problematic social media use drawing on dual-system theories	Cognitive-behavioural control			Dual-system Theory (Evans 2008; Strack and Deutsch 2004) Dual-system Perspective (Hofmann et al. 2009)	Self-control was conceptualised as a cognitive-behavioural control (impulsive brain system) which competes with a cognitive-emotional preoccupation (reflexive). The balance between the two systems defined the extent of problematic use. Cognitive-behavioural control negatively moderated the impact of cognitive-emotional preoccupation on problematic Facebook use.	✓

Assunção and Mato (2017)	To validate the Portuguese version of GPIUS2 (Generalized Problematic Internet Use Scale 2) and test the cognitive-behavioural model for the Facebook context	Deficient self-regulation				Cognitive-behavioural Model of Pathological Internet Use (Caplan 2002; Caplan 2010; Davis 2001) Self-regulation Framework (LaRose et al. 2003)	Deficient self-regulation was interpreted as a dysfunctional behaviour which was most likely to regulate mood and negatively influence personal well-being. Deficient self-regulation emerged as a mediator for relationships between (1) preference for online social interaction and negative outcomes; (2) mood regulation and negative outcomes.	✓
Firat (2017)	To explore relationships between variables of self-control and Facebook use	Self-control failure				Self-control Failure Framework (Rachlin 2000) Dual Motive Conceptualisation of Self-control (Fujita 2011)	Self-control was conceptualised as a dual-motives conflict or a contradiction between the beliefs and actions of the same user. Stronger impulses are associated with self-control failure.	✓
Ho et al. (2017)	To examine how TPB factors and personality traits relate to excessive and addictive social media use	PBC	TPB (Ajzen 1991)	Five-factor Personality Model (McCrae and Costa 1987; Özgüven and Mucan 2013)	Self-regulation Framework (LaRose et al. 2003)		PBC was interpreted as an effort to control personal behaviour on social media and as a predictor of goal-directed activities. Contrary to expectations, the attitude was not associated with excessive use. Personality traits significantly increased the variance explained for excessive use.	✓
Lee et al. (2017)	To extend the social cognitive framework and test the deficient self-regulation as an antecedent of social media use	Deficient self-regulation		Social Identity Framework (Davis 2013)	Self-regulation Framework (LaRose et al. 2003)	Social Cognitive Theory (Bandura 2001)	Deficient self-regulation was conceptualised as a defective ability to control personal behaviour which results in the habitual automatic behaviour. Deficient self-regulation and social media habit strength were antecedents of time spent on social media.	✓

Van Koningsbruggen et al. (2017)	To explore the reaction to social media cues	Self-control Failure	Framework of Immediate Gratifications (Hofmann, Reinecke, and Meier 2016)	Strength Model of Self-control (Hofmann et al. 2012)	Dual-system Theory (Hofmann et al. 2009; Strack and Deutsch 2004)	Self-control failure was conceptualised as spontaneous impulsive hedonic reactions to pleasurable stimuli. Spontaneous reactions to social media cues were related to self-reported cravings and problematic social media use.	✓
Cao et al. (2018)	To conceptualise problematic mobile social media use	Cognitive-behavioural control	Use and Gratifications Theory (Palmgreen and Rayburn 1982)		Dual-system Theory, Cognitive-behavioural Model (Collins and Lapp 1992; Turel and Qahri-Saremi 2016) Stressor-strain-outcome Model (Koeske and Koeske 1993)	Excessive mobile social media use was interpreted as an imbalance between cognitive-emotional preoccupation and cognitive-behavioural control. The role of cognitive-behavioural control was to inhibit the desire to react to environmental stimuli and prevent the execution of the motivational states. The problematic use was considered to be unplanned.	✓
Du et al. (2018)	To develop a brief self-report measure of social media self-control failure	Self-control failure	Framework of Immediate Gratifications (Hofmann et al. 2016) “Ego-depletion” Framework (Salmon, Adriaanse, De Vet, Fennis, and De Ridder 2014)	Strength Model of Self-control (Baumeister et al. 2007)	Social Cognitive Theory (LaRose and Eastin 2004)	Self-control failure was described as a conflict between spontaneous behaviour to follow temptations to use social media and the pursuit of other valuable goals. Being capable of applying self-control did not automatically equal controlling social media use.	✓

Osatuyi and Turel (2018)	To extend prior dual system models for the social media context.	Self-regulation		Social Self-regulation (Carver and Scheier 2001)		Dual-system Theory (Strack and Deutsch 2004) Framework of Habitual Behaviour (Verplanken, Aarts, and Van Knippenberg 1997)	Addictive social media use was interpreted as a conflict between social self-regulation (reflective) and a habit (reflexive). Social self-regulation was negatively associated with social media use.	✓
Polites et al. (2018)	To explore the identity-based explanation for a perception of social media use	Self-regulation deficiency	TPB (Ajzen 1991). Theory of Reasoned Action (TRA) (Ajzen and Fishbein 1980)	IT Identity (Carter and Grover 2015) Self-discrepancy Theory (Higgins 1987)	Deficient Self-regulation of Time (Macan 1994)	Dual-system Model (Strack and Deutsch 2015)	The self-regulation deficiency was interpreted as an imbalance between the extent of social media usage (reflective system) and social media habit (reflexive system) which is mediated by social media identity. Social media identity had a positive impact on deficient self-regulation of time.	✓
Cudo et al. (2019)	To verify Facebook addiction predictors including impulsivity	Self-control			Theory of Action Control (Kuhl 1994)	2-mode Control Model (Carver 2005) Dual-system Theory (Hofmann et al. 2009; Turel and Qahri-Saremi 2016)	Self-control was interpreted as a multidimensional construct with the impulsivity as one of its dimensions. Impulsivity was a significant predictor of Facebook addiction.	✓
Du et al. (2019)	To explore predictors of social media self-control failure	Self-control failure		Framework of Immediate Gratifications (Hofmann et al. 2016)	Strength Theory of Self-control (Hofmann et al. 2012)	Framework of Habitual Behaviour (Verplanken and Orbell 2003) Social Cognitive Theory (LaRose and Eastin 2004)	Social media control failure was interpreted as a multifaceted construct with the habitual checking, the impact of notifications and ubiquity as its antecedents. Immediate gratifications played an indirect role in driving self-control failures.	✓

Foroughi et al. (2019)	To examine the impacts of individuals' needs on Facebook addiction with the moderating effect of self-regulation	Self-regulation	Uses and Gratifications Theory (Katz et al. 1973; Pornsakulvanich, Haridakis, and Rubin 2008)	Self-regulation Framework (Carver 2004)	Social Cognitive Perspective (LaRose and Eastin 2004; Zimmerman 2000)	Self-regulation was interpreted as a moderator of relationships between individuals' entertainment needs and Facebook addiction.	
Gao et al. (2019)	To explore the underlying mechanism of the inhibitory control in excessive users	Self-control			Inhibitory Control (Diamond 2013) Cognitive Processing Theory (Franken 2003)	Self-control was conceptualised as one of the aspects of inhibitory control which means acting not impulsively and resisting temptations such as social media cues. Excessive users allocated more attentional resources to social media cues which made them vulnerable to addiction.	✓
Iranmanesh et al. (2019)	To explore the impacts of emotional states on Facebook addiction and the moderating effect of self-control on the relationship between Facebook addiction and individuals' performance.	Self-control	Framework of Immediate Gratifications (Gottfredson and Hirschi 1990)	Strength Model of Self-control (Tangney et al. 2004)	Social-cognitive Learning Theory (Bandura 1991, 2001)	Low self-control was interpreted as a moderator in the relationship between Facebook addiction and individuals' performance. Immediate gratification was an important characteristic of individuals with low self-control.	✓

Leng et al. (2019)	To study the cravings of social media within the cue-reactivity paradigm	The impulse to addictive behaviour	Theory of Craving (Sayette et al. 2000)		Cue-reactivity Paradigm (Carter and Tiffany 2001) Person-affect-cognition-execution Model (Brand, Young, Laier, Wölfling, and Potenza 2016)	The impulse to conduct addictive social media behaviour was described as a subjective motivational state that one cannot restrain. Social media cues could significantly induce the craving and excitability of social media.	✓
Whelan et al. (2020)	To explore how deficient self-regulation mediates the relationship between social media overload and academic performance	Deficient self-regulation	Self-determination Theory (Deci and Ryan 1985)	Strength Model of Self-regulation (Baumeister et al. 2007)	Social Learning Theory and Situation – organism – behaviour-consequence model (Davis and Luthans 1980) Dual-systems Theory (Evans 2008)	Self-regulation was interpreted as a covert behaviour or the capacity to change the impulsive behaviour to follow long-term goals but can deplete over time. Deficient self-regulation mediated the relationship between communication overload and academic performance.	✓

Appendix 2: Study One. Databases, Criteria and Records Retrieved

Database	Collection(s)	Database Subject (canterbury.ac.nz 2020)	Identified Records	Records for Final Assessment	Search Terms
EBSCO	EBSCOhost	Media, Communication, Journalism	354	19	
ACM	ACM digital library	Computer Science and Software Engineering	3 06	2	
IEEE	IEEE Xplore	Computer Science and Software Engineering	416	3	("self control" OR "self management" OR "self regulation") AND ("social media" OR "social network sites" OR "SNS" OR "Facebook") NOT ("patient" OR "clinical" OR "medicine")
Scopus	Scopus	Multidisciplinary	133	24	
Elsevier Science	Science Direct	Medicine and Technology, Computer Science and Software Engineering	579	7	
PsychInfo	PsychInfo	Psychology	146	26	
SAGE	Sage journals online	Business, Humanities, Social Science	92	1	
Google Scholar	Google Scholar (manually)	Multidisciplinary	6	6	
			2032	88	

Appendix 3: Study One. Quality Assessment Results Against the Effective Public Health Practice Project (EPHPP) for Selected Records

Author(s)/Year	Selection Bias	Design	Blinding	Data Collection Method	Withdrawals/ Dropouts	EPHPP quality rating
Pelling & White (2009)	Weak	Moderate	Moderate	Strong	Weak	Weak
Baker & White (2010)	Moderate	Moderate	Moderate	Strong	Strong	Strong
Omar & Subramanian (2013)	Moderate	Moderate	Weak	Moderate	Strong	Moderate
Wilcox & Stephen (2013)	Moderate	Strong	Strong	Strong	Moderate	Strong
Panek (2014)	Moderate	Moderate	Moderate	Strong	Moderate	Strong
Błachnio & Przepiorka (2016)	Weak	Moderate	Moderate	Strong	Moderate	Moderate
Meier et al. (2016a)	Weak	Moderate	Strong	Moderate	Moderate	Moderate
Turel (2016)	Strong	Moderate	Moderate	Strong	Strong	Strong
Assunção & Mato (2017)	Moderate	Moderate	Moderate	Strong	Moderate	Strong
Firat (2017)	Moderate	Moderate	Weak	Strong	Moderate	Moderate
Ho et al. (2017)	Strong	Moderate	Moderate	Strong	Strong	Strong
Lee et al. (2017)	Moderate	Moderate	Moderate	Moderate	Moderate	Strong
Van Koningsbruggen et al. (2017)	Moderate	Strong	Strong	Strong	Moderate	Strong
Cao et al. (2018)	Moderate	Moderate	Weak	Strong	Moderate	Moderate
Du et al. (2018)	Moderate	Moderate	Moderate	Strong	Strong	Strong
Osatuyi & Turel (2018)	Strong	Moderate	Moderate	Strong	Strong	Strong
Polites et al. (2018)	Weak	Moderate	Strong	Moderate	Moderate	Moderate
Cudo et al. (2019)	Moderate	Moderate	Moderate	Strong	Moderate	Strong
Du et al. (2019)	Moderate	Moderate	Moderate	Moderate	Strong	Strong
Foroughi et al. (2019)	Moderate	Moderate	Moderate	Strong	Moderate	Strong
Gao et al. (2019)	Moderate	Strong	Strong	Strong	Moderate	Strong
Iranmanesh et al. (2019)	Strong	Moderate	Moderate	Strong	Strong	Strong
Leng et al. (2019)	Moderate	Strong	Strong	Strong	Moderate	Strong
Whelan et al. (2020)	Weak	Moderate	Strong	Moderate	Moderate	Moderate

Appendix 4: Study Two. Images for Target Stimuli Used in the SC-IAT

Image 1. A non-existing social media profile

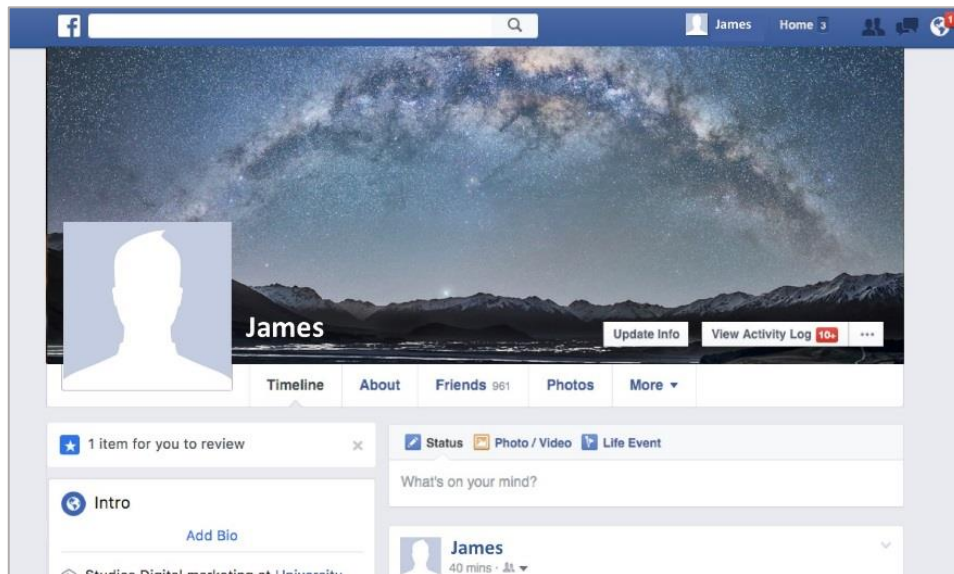
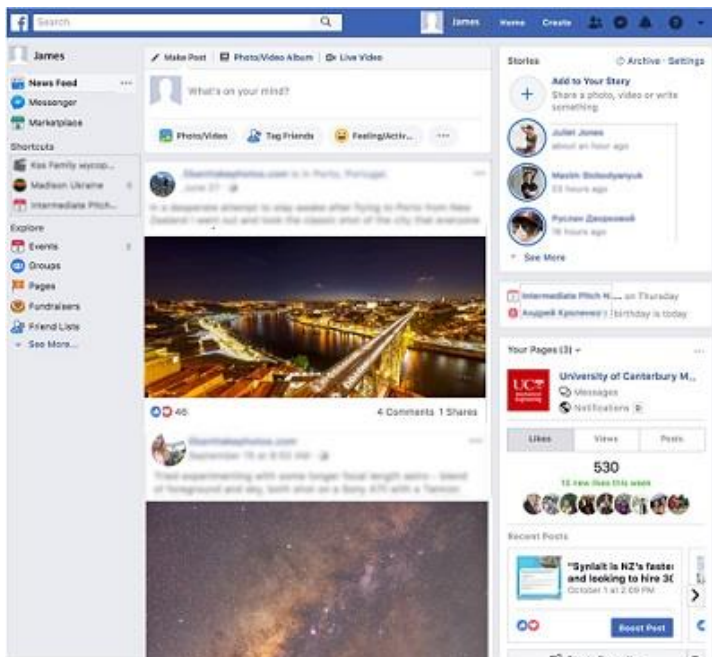


Image 2. Social media “Like” button



Image 3. Social media newsfeed



Appendices

Image 4. Social media notification icon



Image 5. Social media messenger

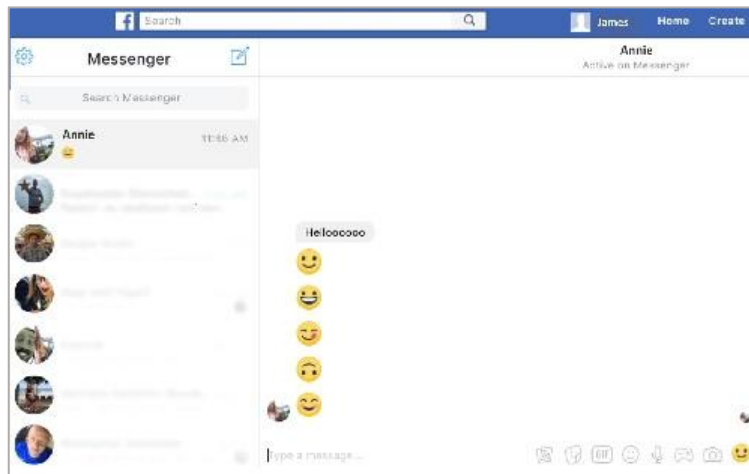


Image 6. Social media status update

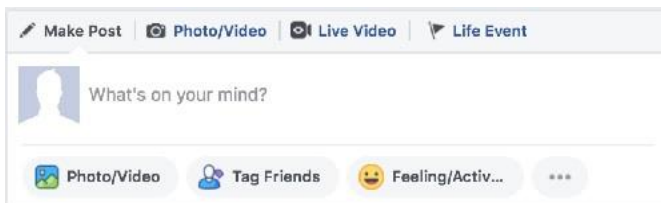


Image 7. Social media button for adding contacts



Note: All identifiers have been removed

Appendix 5: Study Two. Screenshots of SC-IAT

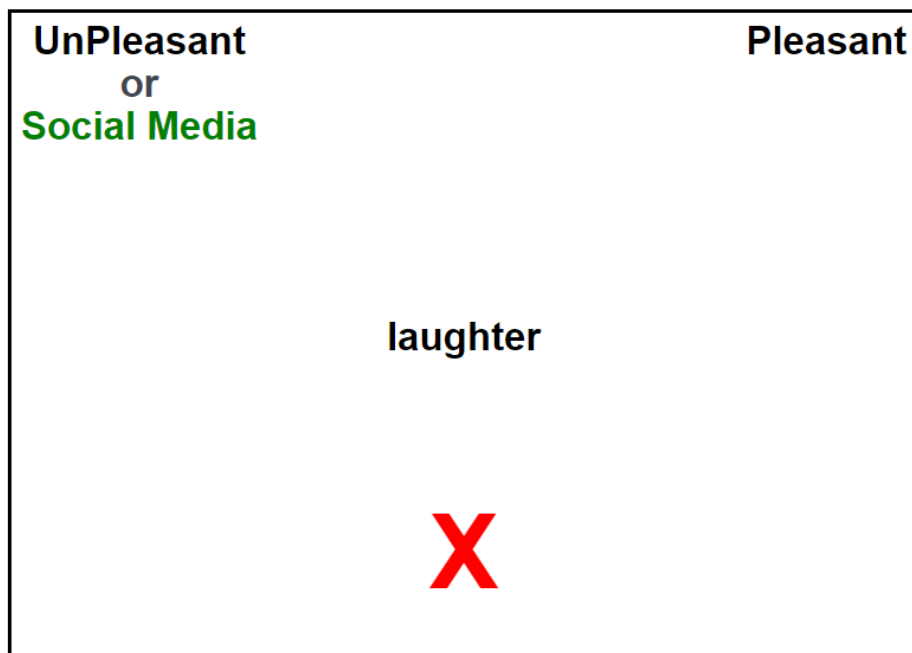
Instructions before the test

UnPleasant or Social Media	Pleasant
<p>+</p> <p>Instructions: Place your left and right index fingers on the E and I keys. At the top of the screen are 3 categories. In the task, words and/or images appear in the middle of the screen.</p> <p>When the word/image belongs to the category/categories on the left, press the E key as fast as you can. When it belongs to the category/categories on the right, press the I key as fast as you can. If you make an error, a red X will appear. Correct errors by hitting the other key. The label/item colors may help you identify the appropriate category.</p> <p>Please try to go as <i>fast as you can</i> while making as few errors as possible.</p> <p>When you are ready, please press the [Space] bar to begin.</p> <p>Part 1 of 4</p>	

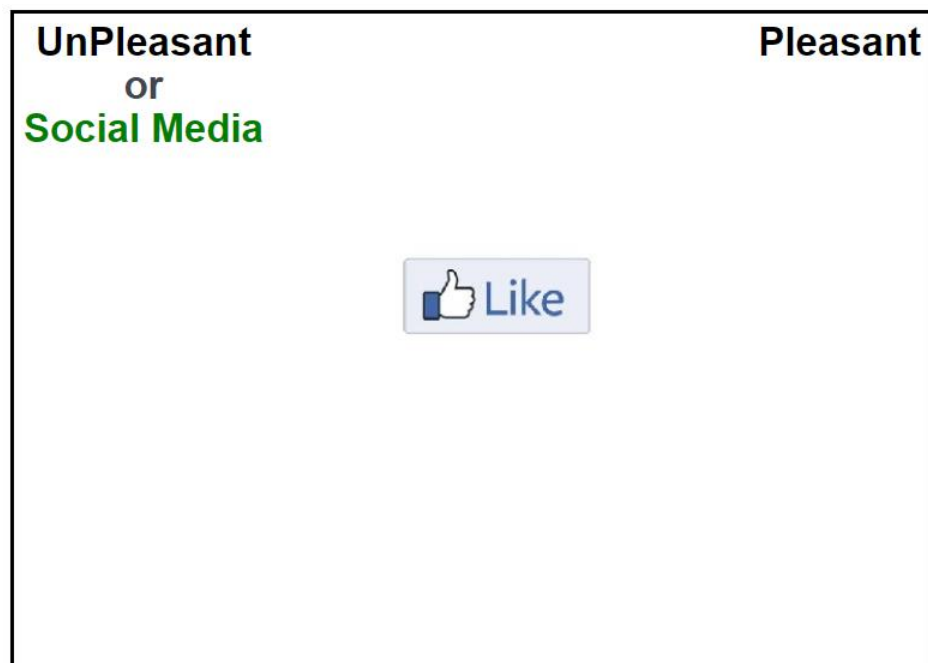
Example of a word stimuli

UnPleasant or Social Media	Pleasant
<p>laughter</p>	

Example of a wrong answer



Example of an image stimuli



Appendix 6: Study Two. Screening Survey Questionnaire

Factor or Purpose	Item(s)
Age	Please indicate your age (full years)
Technical facilities	Can you use a device with the keyboard (not a smartphone) for the next possible survey? (Single answer: Yes, I can use a device with the keyboard for this study; No, I cannot use a device with the keyboard for this study)
General social media use	On what social media do you have your personal account and use it regularly? (multiple answer: Facebook; Instagram; Twitter; YouTube; Reddit; Tumblr; Other _____; I do not have a personal social media account; I have a personal social media account but I do not use it regularly)
General social media use	On average, how much time do you spend on social media for personal purposes each day? (single answer: Less than 30 minutes; Between 30 minutes to 1 hour; Between 1 to 2 hours; Between 2 to 3 hours; Between 3 to 5 hours; More than 5 hours)
English proficiency screener	Which of the following words is most related to "moody"? (multiple answer: Fickle, Balanced, Unpredictable, Gracious, Sulky, Happy)
Open-ended question as a protective practice from "farmers"	Please describe how to follow a user (somebody's personal account) on any social media.

Appendix 7: Study Two. Self-report Questionnaire for the Main Survey

Factor	Items with coding if applicable
General social media use	Out of all the time you spend online, what approximate percentage of that time do you spend on social media for personal (not professional) purposes? (Single answer: Less than 25%; 25-50%; 51-75%; 76-100%)
	On average, how many times a day do you log on social media for personal (not professional) purposes? (single answer: Once per day or less; 2-4 times/day; 5-9 times/day; 10-15 times/day; Over 15 times/day)
	Approximately, how many social media connections (e.g. Facebook friends etc.) do you have in your personal social media account? (single answer: None; 1-100; 101-300; 301-500; 501-1000; More than 1000; I do not remember)
	Each time you log on, on average, how long are you actively using social media for personal (not professional) purposes? (single answer: Less than 5 minutes; 5 to 10 minutes; 11 to 20 minutes; 21 minutes to an hour; more than an hour)
	How often during the last month have you...
Excessive Social Media Use	ESMU1. ...spent a lot of time thinking about social media or planned use of social media?
	ESMU2. ...become bothered, restless or troubled when you cannot be on social media?
	ESMU3. ...used social media in order to forget about personal problems or when you feel upset?
	ESMU4. ...tried to cut down on the use of social media without success?
	ESMU5. ...spent less time than you should or planned with either family, friends or doing job tasks because of the time you spend on social media?
Impulsive Social Media Use	Below are a number of statements about social media use. Please indicate to what extent each statement matches your experience.
	ISMU1. I stay on social media for longer periods that I intended
	ISMU2. I often fail to control the impulse to go back to social media and log in at the “spur of the moment”.
	ISMU3. I feel impatient and rush through my work to go on social media.
	ISMU4. I find it difficult to stop using social media when I am online.
	ISMU5. I often continue using social media despite my intention to stop.
	ISMU6. I was told more than once that I spend too much time on social media.

	Using the scale provided, please indicate how much each of the following statements reflects how you typically are.
Self-control	<p>SC1. I am good at resisting temptation.</p> <p>SC2. I have a hard time breaking bad habits (R)</p> <p>SC3. I wish I had more self-discipline (R)</p> <p>SC4. Pleasure and fun sometimes keep me from getting work done. (R)</p> <p>SC5. I am able to work effectively towards long-term goals</p>
	Below are a number of statements about social media use. Please indicate to what extent each statement matches your experience.
Poor Well-being	<p>PWB1. My interactions with friends or family members have decreased as a result of social media use.</p> <p>PWB2. I feel tired during the day because of using social media late at night</p> <p>PWB3. I check my social media account before something else I need to do.</p> <p>PWB4. I make it a habit to sleep less so that more time can be spent on social media.</p> <p>PWB5. Although using social media has negatively affected my relationships, the amount of time I spend online has not decreased</p> <p>PWB6. My leisure activities have decreased as a result of social media use.</p>
	From the list below, please select those social media activities you had done during the past month:
Social media actions	<p>SMA1. "Liked" any content on social media</p> <p>SMA2. Placed a comment</p> <p>SMA3. Scrolled the newsfeed</p> <p>SMA4. Placed a post/content</p> <p>SMA5. Chatted on social media messenger</p> <p>Other _____</p>
Explicit Attitude	<p>Please, indicate how you feel about your attitude towards social media</p> <p>(Semantic Differential Scale: bad/good, foolish/clever, unpleasant/pleasant, useful/useless, boring/interesting. Negative/positive)</p>

Note: (R) - reverse item.

Appendix 8: Study Two. Filler Tasks

Filler Task 1

Please indicate the extent of how pleasant this painting is for you using the scale below.



1 2 3 4 5 6 7
Unpleasant ○ ○ ○ ○ ○ ○ ○ Pleasant

Filler Task 2

Please indicate the extent of how pleasant this painting is for you using the scale below.



1 2 3 4 5 6 7
Unpleasant ○ ○ ○ ○ ○ ○ ○ Pleasant

Filler Task 3

You can see **FIVE** selected areas on this painting. Please click **ONCE** on the areas you like and **TWICE** on the areas you do not like.

If you changed your mind, just click on the same area again.



Filler Task 4

Please mark **FIVE** spots of this painting that stands out most for you. For this, click on any spot you want to mark.

If you changed your mind, just move a spot to a new place.



Appendix 9: Study Two. Ethics Approval for the Survey



HUMAN ETHICS COMMITTEE

Secretary, Rebecca Robinson
Telephone: +64 03 369 4588, Extn 94588
Email: human-ethics@canterbury.ac.nz

Ref: HEC 2018/80

11 September 2018

Kseniia Zahrai
Management, Marketing and Entrepreneurship
UNIVERSITY OF CANTERBURY

Dear Kseniia

The Human Ethics Committee advises that your research proposal "Either You Control Social Media Or Social Media Controls You: The Implicit Underlying Mechanism of the Excessive Social Media Use" has been considered and approved.

Please note that this approval is subject to the incorporation of the amendments you have provided in your emails of 25th August and 4th September 2018.

Best wishes for your project.

Yours sincerely

R. Robinson
pp.

Professor Jane Maidment
Chair
University of Canterbury Human Ethics Committee

Appendix 10: Study Two. Information Sheet

Department of Management, Marketing and Entrepreneurship

Principal researcher: *Kseniia Zahrai*

Email: kseniia.zahrai@pg.canterbury.ac.nz

HEC Ref: 2018/80

Research project: **The excessive use of social media** **Information Sheet**

Dear prospective participant,

My name is Kseniia Zahrai and I am a postgraduate student in social marketing at the University of Canterbury, New Zealand. I invite you to participate in my research project.

The study explores **the excessive use of social media**. The aim of this study is to better understand users' attitudes to social media. I invite you to participate in my study if you are between 18 and 44 years old and often use your personal social media account. 'Often' in this context, means that you are using it daily or almost daily and spend, on average, two hours or more per day on it.

Please make sure that you use a device with the keyboard for this survey. Do not use your smartphone or a tablet. The study will start with a brief questionnaire about your social media use. It will be followed by a computerised behavioural task and a number of questions to measure your attitudes towards social media. It will take approximately 30-35 minutes of your time in total.

Your participation is **voluntary and confidential**. You have the right to withdraw from participation at any time without giving any reasons. If you withdraw, I will remove the information provided by you in case this request is made prior to the compilation of the project output. Should you have any concerns about your participation in this project, you are welcome to contact me, **Kseniia Zahrai**, PhD student, University of Canterbury, New Zealand (kseniia.zahrai@pg.canterbury.ac.nz) or my supervisor **Associate Professor Ekant Veer** (ekant.veer@canterbury.ac.nz).

This study has been reviewed and approved by the University of Canterbury Human Ethics Committee; participants should address any complaints to The Chair, Human Ethics Committee, University of Canterbury, Private Bag 4800, Christchurch (human-ethics@canterbury.ac.nz).

Appendices

If you agree to participate in the study, you are asked to submit your survey electronically by clicking the arrow button below. By completing this survey, you are giving informed consent for the use of your responses in the study.

Thank you very much for your participation.
Kseniia Zahrai

